Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers	)	CC Docket No. 01-338
	)	
Implementation of the Local Competition Provisions of the Telecommunications Act of 1996	)	CC Docket No. 96-98
	)	
Deployment of Wireline Services Offering Advanced Telecommunications Capability	)	CC Docket No. 98-147

REPLY DECLARATION OF TERRY L. MURRAY
ON BEHALF OF COVAD COMMUNICATIONS COMPANY

I. Witness Qualifications

1. My name is Terry L. Murray. I am President of the consulting firm Murray & Cratty, LLC. My business address is 227 Palm Drive, Piedmont, CA 94610. I am an economist specializing in analysis of regulated industries. I received an M.A. and M.Phil. in Economics from Yale University and an A.B. in Economics from Oberlin College. At Yale, I was admitted to doctoral candidacy and completed all requirements for the Ph.D. except the dissertation. My fields of concentration at Yale were industrial organization (including an emphasis on regulatory and antitrust economics) and energy and environmental economics.

2. My professional background includes employment and consulting experiences in the fields of telecommunications, energy and insurance regulation. As a consultant, I have testified or served as an expert on telecommunications issues in proceedings before state regulatory commissions in California, Connecticut, Delaware, the District of

Columbia, Florida, Georgia, Hawaii, Illinois, Kansas, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Nevada, New Jersey, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, Washington and Wisconsin, and before the Federal Communications Commission ("FCC" or "Commission"). My testimony in these proceedings has concerned such issues as costing and pricing for retail services, unbundled network elements ("UNEs") and interconnection; universal service policy; competition policy (including policy toward proposed mergers); incentive regulation and cost of capital.

3. Before I became a consultant in 1990, I was employed as an analyst, commissioner's advisor and manager at the California Public Utilities Commission for approximately six years, culminating in my service as Director of the Division of Ratepayer Advocates. In virtually all of these positions, I had significant responsibility for telecommunications matters. I have also taught economics and regulatory policy at both the undergraduate and graduate levels. My curriculum vitae, attached as Exhibit TLM-1 to this declaration, provides more detail concerning my qualifications and experience.

II. Introduction

4. Covad Communications Company ("Covad") has asked me: (1) to provide an economic framework for analyzing the issues in this proceeding in light of the recent D.C. Circuit Court opinion in *United States Telecom Ass'n v. Bell Atlantic Telephone Companies*, 290 F.3d 415 (D.C. Cir. 2002) (hereafter, "D.C. Circuit opinion" or

"*USTA"*)[1]; and, (2) using that framework, to respond to arguments against a continued requirement that loops, line sharing and interoffice transport be unbundled. I will also respond to various possible arguments that the incumbent local exchange carriers ("incumbents" or "ILECs") and the D.C. Circuit have raised in opposition to mandatory unbundling.

5. In the remainder of my Declaration, I describe an economic framework that the Commission can use to analyze unbundling issues and apply that framework to the evidence in this proceeding. The framework that I propose is based on the *Horizontal Merger Guidelines*[2] issued by the U.S. Department of Justice and the Federal Trade Commission and is particularly well suited to an analysis requiring the examination of competitive issues in specific geographic markets and for specific customer classes.

6. The *Merger Guidelines* approach places heavy emphasis on proper specification of the relevant market and identification of the firms that currently participate in that market or could readily enter if the current market participants attempted to sustain a small, but significant price increase. Once the market and participants are identified, one must determine the market share for each participant, which forms the basis for a measure of "market concentration." The more concentrated the market, the greater the ability of participants in that market to sustain price increases

[1] It is my understanding that the Commission has filed a petition for rehearing with the D.C. Circuit, arguing in part that the framework the D.C. Circuit applied for analyzing impairment is incorrect. I am informed by counsel that, in a petition filed with the D.C. Circuit, Covad has supported the Commission's request for rehearing.

[2] The full text of the *Horizontal Merger Guidelines* of the U.S. Department of Justice and Federal Trade Commission, issued April 2, 1992, and revised April 8, 1997, (hereafter, "*Merger Guidelines*") is available online at http://www.usdoj.gov/atr/public/guidelines/horiz_book/10.html.

or otherwise to constrain the quality or variety of options available to those who wish to buy the product or service in question.

7. Significantly, the *Merger Guidelines* do not accord the same competitive significance to potential entry from firms that must incur significant sunk costs of entry or exit. This is typically the case for firms considering facilities-based entry into local exchange markets. Unless it is likely that such firms would enter the market within two years on a sufficient scale to discipline the ability of current market participants to raise prices, the *Merger Guidelines* accord no weight to such potential competition. Nor should this Commission place much significance in its impairment analysis on claims of the possibility of competition from facilities-based entrants that have not yet entered a particular geographic market.

8. An important conclusion of applying the *Merger Guidelines'* logic to the issues in this proceeding is that competitive local exchange carriers ("competitors" or "CLECs") such as Covad will be impaired in their ability to compete without a mandatory unbundling requirement in markets that are highly concentrated. I show that the quantitative rules in the *Merger Guidelines* can be translated into a minimum number of participating firms below which any geographic market must be deemed to be highly concentrated. Wherever there are five or fewer firms, the *Merger Guidelines* consider the market to be highly concentrated, with a concomitantly high risk of pricing above competitive market levels. This is true for both retail and wholesale markets.

9. This finding alone is sufficient to warrant dismissal of virtually all of the incumbents' "evidence" that supposedly supports elimination of unbundling. Even given the vague market definitions prevalent throughout their comments and supporting

documents, the incumbents rarely if ever allege that *any* market has a sufficiently high number of participants to fall out of the highly concentrated category. Moreover, this finding demonstrates the importance of rejecting proposals to eliminate unbundling requirements upon the showing of as few as two facilities-based competitors in a market, in addition to the incumbent.

10. I further apply the *Merger Guidelines* framework to analyze the specific evidence brought forward concerning stand-alone loops (including DS-1 loops), line sharing and line splitting, and unbundled transport. In each case I conclude, based on a proper definition of the relevant market and consideration of the participants in that market, that there is no basis for the Commission to eliminate current unbundling requirements. The economies of scale and scope that the incumbents enjoy for their transmission grid are simply too great for there to be sufficient facilities-based entry to mitigate the incumbents' market power over these important facilities and functions.

11. Finally, I address three additional arguments that the incumbents and others have raised against mandatory unbundling. I show that mandatory unbundling does not deter efficient facilities-based investment, nor does it deter the incumbents from investing in network modernization. I also show that there is no basis for the Commission to consider cross-subsidies for local service in its unbundling analysis. Not only would such an approach be contrary to the emphasis that the Telecommunications Act of 1996 ("Act") places on explicit, rather than implicit, subsidies, it also ignores the existence of such explicit universal service subsidies on the federal and state level, as well as the increasingly limited need for such subsidies as the incumbents' forward-looking costs for basic network elements such as loops and switching fall.

III. An Economic Framework for Analyzing UNE Issues in Light of the D.C. Circuit Court Opinion

12. The essence of the D.C. Circuit Court's complaint concerning the UNEs adopted in the *UNE Remand Order* is the lack of differentiation among different markets, particularly different geographic markets. For example, the D.C. Circuit opinion states that:

> Of particular importance to this case, the Commission decided to make its unbundling requirements (except for two elements) applicable uniformly to all elements in every geographic or customer market.[3]
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> As to almost every element, the Commission chose to adopt a uniform national rule, mandating the element's unbundling in every geographic market and customer class, without regard to the state of competitive impairment in any particular market. As a result, UNEs will be available to CLECs in many markets where there is no reasonable basis for thinking that competition is suffering from any impairment of a sort that might have the object of Congress's concern.[4]

13. I do not agree with the D.C. Circuit's conclusion (made without a clear factual basis) that the Commission's uniform national unbundling rules have made UNEs available "in many markets where there is no reasonable basis for thinking that competition is suffering from any impairments of a sort that might have the object of Congress's concern."[5] Nonetheless, the D.C. Circuit opinion underscores the need for a process to determine whether there are particular geographic markets or customer classes for which access to UNEs is not necessary to avoid competitive impairment.

14. Making such determinations in a national forum rarely would be the best use of the Commission's or the parties' resources. It is impractical for this Commission to

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[3] *USTA*, 290 F.3d at 419.

[4] *Id.* at 422.

evaluate the specific circumstances in every geographic market for every customer class. In most instances, the geographic markets in question will be at the wire-center level or below (or, in the case of interoffice transport, will involve pairs of wire centers).

15. For example, the potential availability of alternatives to line-sharing in Baltimore is irrelevant to a carrier that is attempting to provide high-bandwidth services to an end-user in Salisbury, Maryland, much less to a carrier seeking to offer such services in Kalamazoo, Michigan, Albuquerque, New Mexico, or Hilo, Hawaii. In fact, even within the Baltimore wire center, the existence of alternative facilities to serve, *e.g.*, customers very close to the central office would not necessarily imply that alternative facilities are available to reach customers in more distant portions of the wire center.

16. Therefore, to meet the Court's requirements concerning the need to differentiate among geographic markets and customer classes, the Commission should establish national guidelines for states to subtract from (pursuant to the specific limitations that I delineate below), or add to, the minimum national list for UNEs. The Commission can also apply these guidelines to evaluate the evidence provided in this docket concerning the alternatives to various UNEs and determine whether alternatives are sufficiently ubiquitous to warrant "delisting" a UNE from the minimum national set of requirements, even without state-specific evaluations of circumstances.

17. Any such guidelines for evaluating the need for access to UNEs in specific geographic and customer markets should be consistent with the underlying purposes of the Act and the unbundling requirement embodied therein—namely, "to promote competition and reduce regulation in order to secure lower prices and higher quality

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[5] *Id.*

services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies."[6] In particular, the guidelines should favor making UNEs available to competitors wherever facilities-based entry is insufficient to reduce the level of market concentration to one in which the incumbents cannot sustain prices above competitive levels.

18. Basing national guidelines for the availability of UNEs on the market concentration measures incorporated in the *Horizontal Merger Guidelines* issued by the U.S. Department of Justice and the Federal Trade Commission is an economically sound approach that comports with the underlying purposes of unbundling. The *Merger Guidelines* embody generally accepted precepts of economic theory concerning the extent to which competition is feasible given particular degrees of market concentration; thus, they are inherently pro-competitive. The *Merger Guidelines* have stood the test of time and have been applied in numerous judicial and regulatory proceedings, including merger proceedings before this Commission and state public utility commissions.[7] Thus, applying this existing tool in a new context facilitates low-cost, efficient regulation and

[6] Telecommunications Act of 1996, Pub.L. 104-104, 110 Stat. 56, codified at 47 U.S.C. § 151 *et seq.* , preamble. As the D.C. Circuit observed, "Congress passed the Telecommunications Act of 1996, Pub.L. 104-104, 110 Stat. 56, codified at 47 U.S.C. § 151 et seq. (the '1996 Act' or the 'Act'), to 'promote competition and reduce regulation in order to secure lower prices and higher quality services for American telecommunications consumers and encourage the rapid deployment of new telecommunications technologies.' 1996 Act, preamble. In pursuit of that goal, § 251 of the Act requires that ILECs 'unbundle' their network elements--that is, provide them on an individual basis to competitive providers on terms prescribed by the Commission. 47 U.S.C. § 251(c)(3)." *USTA*, 290 F.3d at 417.

[7] A recent example of the Commission's application of concepts from the *Merger Guidelines* is FCC 02-166, Hearing Designation Order, *In The Matter of The Applications of Mountain Wireless, Inc. Assignor, And Clear Channel Broadcasting Licenses, Inc., Assignee, For Consent to Assignment of Licenses of WSKW(AM) and WHQO(FM), Skowhegan, Maine,* rel. July 10, 2002. ILEC witnesses have also relied on the *Merger Guidelines*. *See, for example*, MacAvoy Declaration, *In the Matter of Application by New York Telephone Company for Authorization to Provide In Region InterLATA Service*, CC Docket 99-295.

provides a well-understood benchmark for regulators and interested parties to use in evaluating whether a particular UNE should be available in a given market.

19. The primary focus of the *Merger Guidelines* is the assessment of market power. In a statement of the "[p]urpose and [u]nderlying [p]olicy [a]ssumptions of the [g]uidelines," the *Merger Guidelines* indicate that:

> The unifying theme of the Guidelines is that mergers should not be permitted to create or enhance market power or to facilitate its exercise. Market power to a seller is the ability profitably to maintain prices above competitive levels for a significant period of time.(6) In some circumstances, a sole seller (a "monopolist") of a product with no good substitutes can maintain a selling price that is above the level that would prevail if the market were competitive. Similarly, in some circumstances, where only a few firms account for most of the sales of a product, those firms can exercise market power, perhaps even approximating the performance of a monopolist, by either explicitly or implicitly coordinating their actions. Circumstances also may permit a single firm, not a monopolist, to exercise market power through unilateral or non-coordinated conduct -- conduct the success of which does not rely on the concurrence of other firms in the market or on coordinated responses by those firms. In any case, the result of the exercise of market power is a transfer of wealth from buyers to sellers or a misallocation of resources.[8]

20. For similar reasons, the existence of market power is a source of impairment for competitors who seek access to the incumbents' networks as a means of providing local telecommunications services. If, absent the requirement to provide access to UNEs at prices that reflect forward-looking economic cost, the incumbents and/or other providers of similar functionality would be able "profitably to maintain prices [for that functionality] above competitive levels for a significant period of time," competitive entry will be impeded. The end result will be higher prices, lower quality and fewer

[8] *Merger Guidelines*, Section 0.1, footnote omitted.

choices for consumers of local telecommunications services—precisely the opposite of the result that Congress sought to achieve through passage of the Act.

21. The emphasis of the *Merger Guidelines* on market definition provides a useful framework for addressing the D.C. Circuit's concerns about the need to differentiate among geographic markets and, potentially, customer classes in assessing "impairment." Following accepted economic theory, the *Merger Guidelines* state that:

> [a] market is defined as a product or group of products and a geographic area in which it is produced or sold such that a hypothetical profit-maximizing firm, not subject to price regulation, that was the only present and future producer or seller of those products in that area likely would impose at least a "small but significant and nontransitory" increase in price, assuming the terms of sale of all other products are held constant. A relevant market is a group of products and a geographic area that is no bigger than necessary to satisfy this test.[9]

Further,

> [a]bsent price discrimination, a relevant market is described by a product or group of products and a geographic area. In determining whether a hypothetical monopolist would be in a position to exercise market power, it is necessary to evaluate the likely demand responses of consumers to a price increase. A price increase could be made unprofitable by consumers either switching to other products or switching to the same product produced by firms at other locations.[10] The nature and magnitude of these two types of demand responses respectively determine the scope of the product market and the geographic market.[11]

22. This test of market boundaries has obvious relevance to the question of whether lack of access to UNEs impairs a competitor's ability to participate in a

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[9] *Id*., Section 1.0.

[10] As the Department of Justice and Federal Trade Commission note in a subsequent section of the *Merger Guidelines*, "[t]his arbitrage is inherently impossible for many services and is particularly difficult where the product is sold on a delivered basis and where transportation costs are a significant percentage of the final cost." *Merger Guidelines*, Section 1.22, n. 12. In most cases, it is inherently impossible to arbitrage between UNEs or other delivery modalities) produced and delivered at different locations. Hence, as I observed above, the relevant geographic markets typically will be at or below the wire-center level.

particular retail market for local telecommunications services. The relevant market for any feature or function of the local exchange network that constitutes a potential UNE includes only those products or services to which a competitor could turn as an alternative if, absent the requirement to provide access to that feature or function at a cost-based price, the incumbent local exchange carrier attempted to impose a price increase for access to that feature or function.

23. The *Merger Guidelines* also describe the circumstances under which it is important to consider customer classes, as well as geographic boundaries, in assessing a product market:

> In contrast, where a hypothetical monopolist likely would discriminate in prices charged to different groups of buyers, distinguished, for example, by their uses or locations, the Agency may delineate different relevant markets corresponding to each such buyer group. Competition for sales to each such group may be affected differently by a particular merger and markets are delineated by evaluating the demand response of each such buyer group. A relevant market of this kind is described by a collection of products for sale to a given group of buyers.[12]

Thus, the *Merger Guidelines* are particularly well suited to address the specific concerns raised by the D.C. Circuit Court.

A. Applying the Merger Guidelines: Identifying Firms that Participate in the Relevant Market

24. The *Merger Guidelines* specify how to determine the firms that participate in the geographic and product markets defined by consumer (in this case, local competitor) demand response.

> Participants include firms currently producing or selling the market's products in the market's geographic area. In addition,

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[11] *Id.*, Section 1.0.

[12] *Id.*

> participants may include other firms depending on their likely supply responses to a "small but significant and nontransitory" price increase. A firm is viewed as a participant if, in response to a "small but significant and nontransitory" price increase, it likely would enter rapidly into production or sale of a market product in the market's area, without incurring significant sunk costs of entry and exit. Firms likely to make any of these supply responses are considered to be "uncommitted" entrants because their supply response would create new production or sale in the relevant market and because that production or sale could be quickly terminated without significant loss.[13]

The *Merger Guidelines* are footnoted at this point to include the observation that:

> Probable supply responses that require the entrant to incur significant sunk costs of entry and exit are not part of market measurement, but are included in the analysis of the significance of entry. See Section 3. Entrants that must commit substantial sunk costs are regarded as "committed" entrants because those sunk costs make entry irreversible in the short term without foregoing that investment; thus the likelihood of their entry must be evaluated with regard to their long-term profitability.[14]

I will discuss entry analysis in a subsequent section of my declaration.

25. The construct of a "small but significant" price increase is relevant for market definition only,[15] and does not translate directly into the impairment test for access to UNEs. Once the relevant market is defined, the Commission would still have to analyze whether producers in that market can sustain a price sufficiently above forward-looking economic cost to impair the ability of new entrants to compete in associated local markets without access to UNEs at TELRIC prices. The greater the degree of

[13] *Id.*, footnote omitted.

[14] *Id.*, n. 7.

[15] Similarly, the Department of Justice and Federal Trade Commission hold that "[t]he 'small but significant and nontransitory' increase in price is employed solely as a methodological tool for the analysis of mergers: it is not a tolerance level for price increases." *Id.*

concentration in the relevant market, the greater the ability of the producers to sustain a price that would impair competitive entry.[16]

B. Applying the Merger Guidelines: Calculating Market Shares and Concentration

26. In reviewing proposed horizontal mergers, the Department of Justice and Federal Trade Commission calculate market concentration based solely on the market shares (percentage of the market supplied by) current market participants and "uncommitted" entry (entry that does not involve substantial sunk costs).[17] The market shares of the individual participants are combined in a measure of market concentration called the Herfindahl-Hirschman Index ("HHI"), which is firmly grounded in the economic literature. As the *Merger Guidelines* explain:

> The HHI is calculated by summing the squares of the individual market shares of all the participants.(17) Unlike the four-firm concentration ratio, the HHI reflects both the distribution of the market shares of the top four firms and the composition of the market outside the top four firms. It also gives proportionately greater weight to the market shares of the larger firms, in accord with their relative importance in competitive interactions.[18]

Footnote 17 to this section of the *Merger Guidelines* reads:

> For example, a market consisting of four firms with market shares of 30 percent, 30 percent, 20 percent and 20 percent has an HHI of 2600 (302 + 302 + 202 + 202 = 2600). The HHI ranges from l0,000 (in the case of a pure monopoly) to a number approaching zero (in the case of an atomistic market). Although it is desirable to include all firms in the calculation, lack of information about small firms is not critical because such firms do not affect the HHI significantly.

[16] *Compare Merger Guidelines*, Section 2.0.

[17] *Merger Guidelines*, Section 1.4.

[18] *Id.*, Section 1.5.

27. The more firms there are in a market, the lower the HHI is likely to be. Indeed, the maximum HHI value of 10,000 occurs only in a market with a single firm having a 100% market share ($10,000 = 100^2$). But, the number of firms alone does not determine the degree of market concentration as measured by the HHI. For example, a market with eleven firms consisting of a single dominant firm with an 80% market share and ten other firms, each of which has a 2% market share, would have an HHI of 6,440 ($80^2 + 10 * 2^2$). This HHI is substantially higher than even the HHI of 5,000 for a market with only two firms, each of which has an equal 50% share of the market ($5,000 = 2 * 50^2$). As this example illustrates, markets with a single dominant firm can be highly concentrated (such that the dominant firm possesses a significant degree of market power and the corresponding ability to maintain prices above competitive market levels), even if there are numerous other market participants. This aspect of the HHI again corresponds closely to the teachings of economic theory and has significant implications for the analysis of impairment, as I will explain further in the sections that follow.

C. Applying the Merger Guidelines: The Significance of Varying Degrees of Market Concentration

28. The *Merger Guidelines* distinguish among three levels of market concentration, as measured by the HHI: (1) HHI below 1,000 – unconcentrated market; (2) HHI from 1,000-1,800 – moderately concentrated market; (3) HHI above 1,800 – highly concentrated market.[19] The Department of Justice and Federal Trade Commission use the broad categories of market concentration in the *Merger Guidelines* to determine whether to oppose a horizontal merger because of its effect on market concentration. The *Merger Guidelines* call for the two agencies to scrutinize mergers in both highly

concentrated and moderately concentrated markets, and establish especially stringent criteria for the acceptance of mergers in highly concentrated markets.[20]

29. Similarly, the Commission could use these broad categories of market concentration as reasonable quantitative guidelines for determining whether an element should be subject to mandatory unbundling. Unbundling would not be necessary in unconcentrated markets with HHIs below 1,000; would be required in highly concentrated markets with HHIs above 1,800; and would be subject to additional analysis in moderately concentrated markets with HHIs from 1,000 to 1,800. This approach of tying the unbundling requirement to the degree of market concentration has a sound economic basis because market concentration should be highly correlated with the extent of impairment due to lack of access to UNEs. That is, the higher the degree of market concentration, the more readily the incumbent can sustain a price sufficiently above forward-looking economic cost to impair its rivals' ability to compete.

30. The test applies to specific markets, but the Commission can use the same principles to decide whether markets in general are likely to be highly or moderately concentrated. If so, for all the reasons on which I elaborate below, the Commission should retain the element in question on the national UNE list.

31. Moreover, it is possible to simplify the analysis of market concentration somewhat by translating the HHI cutoff values for each of these broad categories into a number of firms that must participate in the market to fall into each category. To do so,

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[19] *Id.*, Section 1.51.

[20] *Id.*.

one must apply a "best case" assumption that each firm in the market is of equal size.[21] This "best case" assumption is, of course, extremely optimistic in the case of local telecommunications, in which the incumbents admit to retaining a far greater than equal share in virtually all markets, even those with a substantial degree of facilities-based entry. Nonetheless, translating the HHI into a number of equivalent firms provides a useful perspective on the degree of competitive entry that is viewed necessary, under the *Merger Guidelines*, to control the negative effects of market concentration.

32. Under the *Merger Guidelines*, there must be more than ten firms in a market for the market to qualify as unconcentrated. An unconcentrated market has an HHI under 1,000. Ten equal-sized firms would each have a 10% market share; hence, the HHI for a market of ten equal-sized firms would be $10^* (10)^2$ or 1,000. Conversely, under the *Merger Guidelines*, a market with five or fewer firms would always be deemed highly concentrated. A highly concentrated market has an HHI over 1,800. Five equal-sized firms would each have a 20% market share; hence, the HHI for a market of five equal-sized firms would be $5 * (20)^2$ or 2,000. As I explained in footnote 21, this is the lowest possible HHI for a market of five firms. Therefore, all markets with five or fewer firms fall into the highly concentrated category.

33. Use of the equivalent-firms version of the HHI cutoff values does not provide a definitive answer in all cases. As I demonstrated in the example of one dominant firm and ten very small firms (*see* paragraph 27 above), even a market with more than ten firms can be highly concentrated. Thus, even markets with ten or more firms would require further analysis of the distribution of firms' market shares before

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[21] Mathematically, the sum of the squared market shares will be lowest if the market shares are all equal.

regulators could support a finding that the market is unconcentrated and unbundling is therefore not required.

34. The facts that, under the *Merger Guidelines*, a market cannot be considered unconcentrated unless there are *at least* ten firms and always is considered highly concentrated when there are less than six firms cast serious doubt on incumbent proposals to "delist" UNEs in markets that can be shown to have as few as two facilities-based competitors in addition to a dominant incumbent firm.[22] Producers in highly concentrated markets generally have the ability to sustain prices above competitive market levels; these above-competitive prices, in turn, impair the ability of firms to purchase access to the facilities and functions in question and thereby enter the local market.

35. The Commission should reject all proposals for "delisting" UNEs supplied in highly concentrated markets. Further, to prevent the incumbents from erecting a new barrier to entry via frivolous (but costly) litigation, the Commission's guidelines for state regulators should prohibit states from entertaining petitions to "delist" any UNE in a market with five or fewer current suppliers plus potential entrants.

36. For the transmission UNEs of special concern to Covad, as well as any other UNEs that involve significant sunk costs, the Commission should provide even more stringent guidelines to states. Because "committed" entry in the face of significant sunk costs is so difficult, the Commission should require states to reject outright any application for "delisting" that does not make a *prima facie* case for the existence of at least four current competitors in the relevant geographic market and does not demonstrate

[22] SBC Comments at 88.

that any additional "committed" entry necessary to sum to the minimum six competitors meets the three-step test of the *Merger Guidelines*.

37. At this time, the Commission should also retain all existing UNEs on the minimum national list if they are typically provided in markets that appear to fall into the moderately concentrated category (subject to the entry analysis described below). Several policy considerations favor the retention of all existing UNEs in moderately concentrated markets. As the Commission has already recognized by its actions to retain the national UNE list subject to the outcome of this proceeding, "delisting" UNEs upon which firms now rely to provide local services can cause considerable market disruption and harm to consumers served by such competitors. The unsettled state of retail local competition also warrants extreme Commission caution in taking any action that might make competitive entry more difficult. Furthermore, the Commission has based several approvals of ILEC entry into in-region interLATA markets under Section 271 of the Act at least in part on the competition existing as a result of the current set of UNEs; a decision to "delist" one or more of these UNEs would therefore require re-evaluation of whether local entry in those markets is truly irrevocable.

38. I note that the D.C. Circuit opinion explicitly acknowledges that the Commission may consider factors other than impairment in determining whether to require incumbents to make UNEs available to competitors at TELRIC-based prices. But, the D.C. Circuit also cautions that "to the extent that the Commission orders access to UNEs in circumstances where there is little or no reason to think that its absence will genuinely impair competition that might otherwise occur, we believe it must point to

something a bit more concrete than its belief in the beneficence of the widest unbundling possible."[23]

39. The approach that I propose addresses this concern in two ways. First, by creating a presumption that UNEs will be "delisted" in unconcentrated markets, my proposal limits access to UNEs to circumstances in which there is good reason to believe that lack of such access could genuinely impair competition that might otherwise occur because the degree of market concentration creates the potential to sustain prices above competitive levels. Second, taking into account the market dislocation from "delisting" current UNEs, the generally weak financial state of entrants to the local exchange market and the Commission's prior reliance on UNE-based competition in approving Section 271 applications for interLATA authority is certainly more concrete than a mere belief in the benefits of the widest possible unbundling obligation.

40. Taken by itself, the market dislocation from "delisting" current UNEs clearly has major public policy implications and would be harmful to existing customers of competitors relying on UNEs. For example, there are tens of thousands of end-users served by competitive carriers using line-sharing. Not all of these customers have the option of obtaining high-speed connections via cable modems. Indeed, the incumbents admit that approximately one-quarter of current residential DSL customers lack a cable modem alternative,[24] a proportion that could well increase as the incumbents extend the reach of DSL to outlying areas through initiatives such as SBC's Project Pronto.[25] Cable

[23] *USTA*, 290 F.3d at 425.

[24] *UNE Fact Report 2002,* Prepared for and Submitted by BellSouth, SBC, Qwest, and Verizon, April 2002, at IV-19 (hereafter, "*UNE Fact Report*").

[25] SBC Investor Briefing No. 211, "SBC Announces Sweeping Broadband Initiative," October 18, 1999 (hereafter, "SBC Investor Briefing"). .

modems are even less an alternative for business DSL customers, both because cable systems were built to reach residential locations and because businesses may require reliability and security that is not available over cable systems.[26] Nor is it clear that the incumbents could readily serve so many new customers all at once. It is entirely reasonable for the Commission to consider the havoc wreaked by such market disruption in determining whether to retain on the national list those UNEs that are provided in both moderately and highly concentrated markets.

41. This is especially true if the Commission adopts rules that provide an "exit strategy" that states can use to determine whether any of the UNEs on the minimum national list should be "delisted" in a particular geographic market. The guidelines that I propose merely shift the focus of such determinations to state proceedings in which the incumbents can bring forward evidence concerning the range and nature of UNE alternatives available in specific geographic markets and where such evidence can be tested through a process that permits discovery concerning the basis for the factual allegations on which the proponents of "delisting" rely.[27] States should not, however, be permitted to entertain applications to "delist" UNEs in any highly concentrated market, such as loops.

42. In the next triennial review, it may also be appropriate for this Commission to perform a case-by-case analysis for UNEs in moderately concentrated markets. If the Commission announces such an intention in its order in this proceeding, competitors will

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[26] Joint Declaration of Anjali Joshi, Eric Moyer, Mark Richman, and Michael Zulevic on Behalf of Covad Communications Company, April 5, 2002, ("Joshi *et al.* Declaration") at ¶¶ 14, 16, 17.

[27] As should become clear from my discussion of particular UNEs in the following sections, such discovery and weighing of the evidence is essential given the generally low quality of the evidence on which the incumbents are relying in this proceeding.

have reasonable notice of the possibility that there will no longer be a national requirement to provide access to certain UNEs for which there are sufficient alternatives in most geographic markets to render the market at most moderately concentrated. Even so, the Commission should adopt a transition strategy such as the one that I described above for any UNE that it "delists" in a subsequent triennial review. *In no event should the Commission consider "delisting" any UNEs provided in highly concentrated markets.*

D. Applying the Merger Guidelines: Entry Analysis

43. Before drawing definitive conclusions about the extent of market concentration and the resultant degree of impairment, the Commission should also consider the competitive significance of "committed" entry, as do the Department of Justice and Federal Trade Commission in their *Merger Guidelines.* "Committed" entry involves "new competition that requires expenditure of significant sunk costs of entry and exit."[28] Incumbents themselves have argued before this Commission that participation in local exchange markets requires precisely such significant sunk costs.[29] Potential "committed" entrants that face such significant sunk costs are not counted as market participants for purposes of calculating concentration under the *Merger Guidelines* because of the uncertainty about whether such firms would pursue "committed" entry in the face of a price increase by market participants.[30] Nonetheless, "committed" entry is not by definition impossible and thus warrants further discussion.

44. In their parallel analysis of horizontal mergers, the Department of Justice and Federal Trade Commission apply a three-step test to determine whether "committed"

[28] *Merger Guidelines*, Section 3.0.

[29] *See, for example,* Rebuttal Testimony of Jerry A. Hausman on behalf of Verizon Virginia, in CC Docket Nos. 00-218, 00-249, and 00-251, August 27, 2001, particularly Table 1.

entry can mitigate the ability of merged firms to sustain a price increase. This three-step test determines whether "entry would be timely, likely, and sufficient in its magnitude, character and scope to deter or counteract the competitive effects of concern."[31] Similarly, I recommend that the Commission give no weight to the potential for "committed" entry in its deliberations concerning access to UNEs unless the potential "committed" entry would satisfy the three-step test of the *Merger Guidelines*.

45. Step one, *timeliness*, generally limits consideration to "only those committed entry alternatives that can be achieved within two years from initial planning to significant market impact."[32] This criterion provides a basis for the Commission to disregard vague anecdotal evidence concerning competition based on new technologies that may be "on the horizon," such as the allegation that "there are new technologies on the near horizon that would enable additional fiber to be deployed without digging up city streets, which 'could cut the time and cost of fiber installation in half.'"[33] (Curiously, although I have participated in numerous UNE cost proceedings across the country over the past two years, I am not aware of a single recent proceeding in which any of the sponsors of the *UNE Fact Report* proposed to cut the forward-looking cost of fiber installation in half in recognition of this new technology.) Rather than relying on evidence that the incumbents themselves consider to be too speculative to reflect in a forward-looking cost study, the Commission instead should consider only clear proof that

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[30] *Merger Guidelines*, Section 1.32.

[31] *Id.*, Section 3.0.

[32] *Id.*, Section 3.2.

[33] *UNE Fact Report*, at III-8.

potential entrants responding to a price increase today could achieve a significant market impact within two years deploying currently available technology.

46. Step two, *likelihood*, compares what the *Merger Guidelines* term "minimum viable scale"[34] and compares that firm size to the sales opportunities available to entrants. "Committed" entry is considered to be "unlikely if the minimum viable scale is larger than the likely sales opportunity available to entrants."[35] Minimum viable scale differs from the economic concept of "minimum efficient scale" in that the former represents "the smallest scale at which average costs equal the premerger price" (or, in the instant case, at which average costs equal the prevailing price in the relevant local market), whereas the latter represents "the smallest scale at which average costs are minimized."[36] Thus, a potential entrant can reach minimum viable scale without achieving the full economies of scale that the incumbent enjoys. If the minimum *efficient* scale is greater than the minimum *viable* scale, however, the potential entrant must carefully weigh the risk that firms with more efficient scale will simply lower their prices in response to entry, leaving the new entrant unable to recover the full sunk costs of such entry.

47. Put another way, the likelihood test is essentially a break-even analysis for entry in the presence of significant sunk costs. By definition, "committed" entry requires a competitor to commit significant resources to a specific market and forces that competitor to recoup its sunk costs from that market, or not at all. Therefore, a potential facilities-based entrant is only *likely* to enter the market if the minimum necessary resource commitment (defined by the minimum viable scale) to be able to meet or beat

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[34] The *Merger Guidelines* defined "minimum viable scale" as "the smallest scale at which average costs equal the premerger price." *Merger Guidelines*, Section 3.3, n. 29.

[35] *Id.*, Section 3.3.

prevailing market prices is sufficiently small that the firm expects to be able to sell the corresponding quantity of its product in the marketplace without dropping the price below the prevailing market price.

48. The combination of the concept of "committed" entry with the concept of minimum viable scale provides a basis for responding to the D.C. Circuit's concern that the economies of scale and scope that the Commission has previously identified as a basis for deeming certain aspects of the incumbents' local networks to be UNEs may reflect merely the typical hurdles faced by new entrants into *any* market.[37] Self-supply is likely feasible in case in which there are no significant sunk costs to entry or exit ("uncommitted" entry), and *may* be feasible in cases in which "committed" entrants can achieve minimum viable scale at prevailing local prices. Insofar as competitors must incur significant sunk cost to entry or exit if they choose to build facilities to serve particular local markets, they do *not* simply face the hurdles that a new entrant into any market must face. In the context of "committed" entry, issues of minimum viable scale play an important role in determining whether a new entrant can likely achieve a sustainable profit and are therefore valid considerations in determining impairment.

49. Step three of the *Merger Guidelines'* test for "committed" entry, *sufficiency*, qualifies the conclusion that the potential for entry of multiple firms at flexible scale is generally adequate to mitigate the ability of market participants to sustain price increases. The *Merger Guidelines* identify at least two circumstances under which this general conclusion may not hold: (1) "entry, although likely, will not be sufficient if, as a result of incumbent control, the tangible and intangible assets required for entry are not

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[36] *Id.*, n. 29.

adequately available for entrants to respond fully to their sales opportunities"; and (2) "where the competitive effect of concern is not uniform across the relevant market, in order for entry to be sufficient, the character and scope of entrants' products must be responsive to the localized sales opportunities that include the output reduction associated with the competitive effect of concern."[38]

50. Both of these limitations are potentially relevant to an impairment analysis and reduce the viability of "committed" entry to mitigate price increases that impair new entrants' ability to provide local exchange services in competition with the incumbents. As an example, consider a wire-center that already has several facilities-based entrants providing fiber-based service to large businesses in a core downtown area, but no facilities-based entrants providing service to residences and small businesses outside that area. Even if it is both possible and likely for additional facilities-based competitors to enter that wire-center, their entry would not be *sufficient* to discipline prices for loops used to serve residential and small business customers in outlying areas unless the potential entrants would provide a product whose "character and scope" is "responsive to the localized sales opportunities" (*i.e.*, provide loop facilities that can be used for voice and medium-bandwidth data services to residential and small business locations outside the downtown area).

51. To summarize, in the absence of a demonstration of timely, likely and sufficient entry to prevent incumbents from setting prices sufficiently above forward-looking economic cost to impair entry, the Commission should find that an element

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[37] *USTA*, 290 F.3d at 426.

[38] *Merger Guidelines*, Section 3.4.

provided in a moderately or highly concentrated market is appropriate for inclusion in the national list of UNEs.

IV. Application of the *Merger Guidelines* Framework to the Evidence in This Proceeding

52. Many of the incumbents' arguments against unbundling become transparently wrong when viewed from the perspective of the *Merger Guidelines* framework that I outlined above. In the following sections, I apply this economic framework to demonstrate the fallacies in the incumbents' arguments concerning stand-alone loops (including DS-1 loops), line-sharing and line-splitting, and interoffice transport.

A. Stand-Alone Unbundled Loops, Including DS-1 Loops

53. For the purpose of an impairment analysis, the relevant geographic market for stand-alone loops is generally at the wire-center level or below. As I noted above, new entrants need access to loop facilities that serve particular customer locations. Covad cannot substitute a loop in a different wire center, or even a different part of the same wire center, for a loop that terminates at its end-user's location. This market definition is equally applicable to the analysis of whether competitors' ability to enter is impaired by lack of UNE access to voice-grade loops, DS-1 loops and higher-capacity loops.

54. Even the incumbents do not claim that there are readily available alternatives to ILEC loop facilities at all locations in all wire centers. Indeed, they assert that "the

availability of substitutes varies significantly among geographic markets,"[39] but do not carefully define those markets.

55. To the extent that the incumbents have identified firms other than the local incumbent that provide loops or loop-like facilities, they have focused on alternative providers of fiber facilities that provide high-capacity loops serving large business customers in densely populated wire centers.[40] Most of these locations are likely to be close to central offices; the incumbents have not asserted that ubiquitous alternatives exist throughout wire centers.

56. Moreover, to the extent that the incumbents allege alternatives exist for *voice-grade* loops, they have focused on cable telephony as an alternative. Even so, they do not assert that cable telephony is a ubiquitous alternative to their own voice-grade facilities; instead, they claim that cable telephony is offered to "more than 10 percent of all U.S. homes" without specifying the precise geographic markets in which cable telephony services are available.[41]

57. Apart from the limited nature of the cable alternative that the incumbents describe, the Commission should disregard this evidence because it addresses the wrong market. The incumbents are pointing to services available to end-users, but any determination concerning access to UNEs must turn on the alternatives available to *carriers* seeking to enter a given local market. That is, the relevant market is the wholesale market for loop facilities, or functional substitutes for those facilities, including the possibility of self-supply.

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[39] *UNE Fact Report* at IV-1.

[40] *Id.*

58. Cable providers are not required to make their facilities available to other competitors, as the Commission confirmed in a declaratory ruling in March of this year. Hence, the cable option is typically no option at all for a carrier such as Covad.[42]

59. Also, cable service is a franchise monopoly. Therefore, the option of using cable facilities to self-supply substitutes for loop facilities is only available to the franchised cable operator in a given local area. Given this limitation, the existence of a cable telephony option in addition to the loop facilities of an incumbent local exchange carrier would leave a highly concentrated market, even if cable providers were required or voluntarily chose to provide other carriers with access to their "loop" facilities. The HHI for a market with one ILEC and one cable provider of substitute "loops" would be, at best (that is, assuming equal market shares), 5,000 ($50^2 + 50^2$), a figure that falls well above the *Merger Guidelines*' HHI cutoff of 1,800 for a highly concentrated market. In such a concentrated market, there is no guarantee that competitors such as Covad could gain access to broadband-capable facilities at a price that would not impair their ability to enter the local market. To the contrary, such a concentrated market presents conditions under which the producers could likely sustain above-competitive prices for the facilities that they offer.

60. This result is not only bad for competitors such as Covad, it is bad for consumers as well. A retail market served by only two providers is one in which *retail* prices for local services may well remain above competitive levels indefinitely. If, instead, the incumbent is compelled to provide access to UNEs at prices equal to

[41] *UNE Fact Report* at I-3. The incumbents also discuss fixed wireless service as a substitute, but acknowledge that the market share for such fixed wireless services today is trivial. *Id.* at IV-19.

[42] Joshi *et al.* Declaration at ¶ 13.

forward-looking economic cost, there instantly becomes the possibility of numerous competitive alternatives for customers, with each of those competitors having a cost structure (at least with respect to the UNE functions) as low as the incumbents. This more atomistic competition holds real promise for driving retail prices toward cost, in stark contrast to the local duopoly with which the incumbents would have the Commission be satisfied.

61. Thus far, I have considered only current market participants. Under the *Merger Guidelines*, any analysis of market concentration must also take into account the potential, if any, for "uncommitted" entry. For unbundled loops, that possibility is virtually nil because, as the incumbents themselves have stressed, building loop facilities requires a competitor to make a significant investment in physical facilities to serve a particular local market and thus entails substantial sunk costs of entry and exit. In an arbitration proceeding before this Commission, Verizon Virginia estimated that 52% of the forward-looking investment in its own loop facilities consists of sunk costs.[43]

62. Nor is it likely that "committed" entry will mitigate the ability of the incumbents to sustain prices above competitive levels if the Commission eliminates the requirement to unbundle loops. The cost results shown in the Declaration of Richard N. Clarke strongly suggest that further "committed" entry is not *likely* because an entrant attempting to supply loops ubiquitously throughout a wire center, whether for self-supply or to serve the wholesale market, would experience far higher average unit costs than the incumbent, even at relatively high penetration levels.[44]

[43] Rebuttal Testimony of Jerry A. Hausman on behalf of Verizon Virginia, in CC Docket Nos. 00-218, 00-249, and 00-251, August 27, 2001, Table 1.

[44] Declaration of Richard N. Clarke on behalf of AT&T, April 5, 2002, at, *e.g.*, ¶¶ 30, 33.

63. The same impairment analysis applies for DS-1 loops. Again, the relevant market is at or below the wire-center level because loops are not fungible between end-user locations. The number of current competitors in any given geographic market is generally too low for the market to qualify as either moderately concentrated or unconcentrated, as even the ILEC evidence shows. The ILEC evidence that comes closest to address specific relevant geographic markets is the evidence concerning the number of fiber-based collocators in ILEC central offices, provided in the conext of interoffice transport. This evidence shows that only seven percent of the Regional Bell Operating Company central offices nationwide have four or more fiber-based collocators.[45] Thus, even giving the incumbents the benefit of the doubt concerning whether all of these fiber-based collocators are providing alternative high-capacity loop facilities, virtually every central office in the country appears to fall into the highly concentrated category.[46] The level of competitive alternatives for locations outside of core urban areas is undoubtedly much lower. The existence of significant sunk costs precludes any possibility of "uncommitted" entry. And, the likelihood of "committed" entry is low because the incumbents can use the same outside plant facilities—with the same economies of scale and scope that Dr. Clarke describes for voice-grade loops—to provide DS-1 loops, whereas a new entrant cannot achieve comparable scale and scope economies without a level of penetration that exceed any plausible "sales opportunity," to use the terms of the *Merger Guidelines*.

[45] *UNE Fact Report* at III-3.

[46] The incumbents try to bolster their case by reporting the alleged average number of CLEC networks by MSA (*id.* at III-7), but this evidence does not demonstrate how many CLECs serve any particular portion of an MSA. Thus, because loops are one location are not substitutes for loops at a different location, the evidence concerning the number of networks in each MSA is simply irrelevant to the Commission's impairment inquiry.

64. The incumbents have suggested that CLECs are not impaired without access to high-capacity loops because CLECs overwhelmingly choose to deploy their own high-capacity facilities rather than purchase unbundled high-capacity loops from the incumbents.[47] The Commission should put the statistics that the incumbents cite in perspective. The requirement to unbundle high-capacity loops such as DS-3s has been in place a relatively short time, and there has been substantial regulatory lag in setting prices for such loops. For example, even today, California has only adopted interim prices, subject to true-up, for SBC Pacific Bell's DS-1 and DS-3 loops, and has no prices whatsoever in place for higher capacity loops. It is little wonder that competitors have chosen to build their own facilities, insofar as possible, rather than accept uncertain prices subject to true-up or wait indefinitely for permanent prices to be adopted.

65. For all of the reasons above, the Commission should continue to require the incumbents to provide access to unbundled loops, including DS-1 loops. Clearly, a high degree of concentration exists, particularly in markets past the immediate vicinity of central offices. Given this high degree of market concentration and the lack of mitigation of market power from "committed" entry, all loop types should remain on the national UNE list.

B. Line Sharing and Line Splitting

66. Much of the impairment analysis for stand-alone unbundled loops above applies with equal force to line-sharing and line-splitting. In particular, as was the case with stand-alone loops, the incumbents' presentation ignores the fundamental issue of market definition in several respects. They rely on vague generalities about the

[47] *Id.* at IV-6 to IV-7.

availability of cable modem service, fixed wireless and other alleged alternatives to line-shared DSL services without assessing whether these alternatives are truly in the same product market (based on consumer perception and demand responses) or defining specific geographic markets. Moreover, their arguments focus on the *retail* market, rather than on the market alternatives available to competitors such as Covad that seek to provide broadband services themselves.

67. Even on their own terms (*i.e.*, as assessments of the retail market), the incumbents' analyses are faulty. They have failed to consider the degree to which consumers perceive the products that they identify to be substitutes for broadband services provided using DSL technology. The evidence concerning substitutability suggests that the incumbents' market definition is both overbroad and underinclusive in ways that lead the incumbents to exaggerate the degree to which they and their affiliates dominate the retail market.

68. The incumbents' implicit definition of the retail market is overbroad because it includes services that consumers (especially business customers) perceive to be highly dissimilar to DSL. For example, satellite alternatives to both line-shared DSL and DSL over stand-alone loops are not sufficiently similar in quality to be perceived by consumers as a true substitute for DSL services. As Anjali Joshi *et al*. explained in their Declaration on behalf of Covad, most satellite services either are not two-way or have extremely limited upload capability, which makes them unattractive to business customers. Moreover, residential customers will not perceive satellite services as a substitute for line-shared DSL because the delay inherent in satellite services renders

them unsuitable for voice transmission (and therefore for a combined voice-data solution such as that available over a line-shared loop).[48]

69. Similarly, at least for business customers, the incumbents' retail market definition is overbroad in including cable modem services. Such services are not designed to provide the security, reliability or upload speeds that businesses often require.[49]

70. The incumbents' retail market analysis is also underinclusive because it excludes dial-up Internet access, which is still the predominant method for residential consumers to access the Internet. There is sufficient cross-elasticity of demand between dial-up access and broadband services (*i.e.*, an increase in the price of one service will make consumers more likely to choose the other) to justify including dial-up access in the relevant retail market. Had the incumbents included dial-up access, which occurs in the vast majority of cases over loops that the incumbents provide, their analysis would have revealed a much higher degree of market concentration that their comments and supporting documents suggest.

71. The incumbents' presentations also provide little information concerning the geographic coverage of each broadband services provider and hence, provide virtually no insight as to how many of the supposed options, if any, would be available to any given end-user location. In reality, most end users may actually have only one option in addition to dial-up access. The incumbents acknowledge that only 33% of customers in a nationwide survey had both DSL and cable options available for high-speed Internet

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[48] Joshi *et al*. Declaration at ¶¶ 24-26.

[49] *Id.* at ¶¶ 14, 16, 17.

access.[50] Even customers in major metropolitan areas may lack choices. For example, cable modem service is not available in the Oakland metropolitan area and, as recently as June 2002, the local cable provider in this major California metropolitan area was telling potential customers that it had no specific plans or dates for upgrading the cable plant to enable cable modem service to be provided. Cable modem service is also unavailable in Washington, D.C., at the present.

72. The incumbents' sketchy data provides no basis for drawing any firm inferences concerning the number of alternatives available to end-users in particular geographic markets, much less the alternatives available to competitors such as Covad. As I noted in discussing stand-alone loops, the latter question is the one that is relevant to an analysis of impairment. From that perspective, cable providers are relevant only as potential "committed" entrants because they do not currently offer other competitors access to their networks. Moreover, even if one were to include the cable provider as a participant in each local market, the result would be a formidable degree of market concentration that constitutes *prima facie* evidence of impairment.

73. In short, DSL competitors such as Covad have no real alternatives to use of the incumbents' loop facilities. To understand the competitive impact of line-sharing, one must first understand the advantages that the incumbents otherwise would have in providing broadband services to residential customers (the customers typically served by line-sharing arrangements) by virtue of their control over bottleneck local exchange facilities. The incumbents offer a form of DSL service, known as ADSL, to retail customers using the same telephone line that those customers purchase from the

[50] *UNE Fact Report* at IV-19.

incumbents for voice-grade local exchange services. In fact, the incumbents' ADSL tariffs require customers to purchase basic exchange service from the incumbents if they wish to buy ADSL service from the incumbents or their affiliates.

74. The incumbents acknowledge that they incur no incremental loop cost to provide the high-frequency portion of the loop to themselves or to a competitor such as Covad beyond the cost of the telephone line used for the underlying POTS service to which the end-user customer subscribes.[51] Indeed, in most cases, the incumbents recover the cost of the loop from the local exchange service that they require their ADSL customers to buy. Even when the incumbents provide ADSL service through an affiliate and "charge" that affiliate for use of the high frequency portion of the loop, the total firm-wide cost to the incumbents for use of the loop remains the same, and the revenue that the incumbent receives from the affiliate is merely a transfer of profits from one corporate pocket to another, with no significance for the corporate "bottom line."

75. Without the requirement for line sharing, the incumbents would be able to deny Covad and other DSL competitors the right to leverage the local loop bottleneck in the same manner that the incumbents themselves are able to do. Instead, DSL competitors would have only two alternatives. They could provide DSL services over a stand-alone loop, in which case they must recover all of the cost of that loop from the DSL service. Or, they could provide both DSL and POTS services over a single loop, in which case they must acquire the resources and expertise to provide voice services as well as DSL services. Both alternatives would drastically increase the cost of entry relative to the true economic costs that the incumbents and their affiliates face.

76. Line-sharing makes it possible for competitors to offer DSL services over the same line that a consumer uses for POTS service without having to take over responsibility for providing the POTS service. This approach allows competitors such as Covad to focus solely on providing DSL services without having to acquire the resources or the expertise to provide other types of telecommunications services. It also removes the cost disadvantage that a DSL-only provider would face if it had to provide DSL service over a stand-alone loop. Thus, more competitors are able to provide broadband services, and they should be able to do so in a manner that enables them to incur no greater costs than the incumbent or its affiliate will incur. Easier entry means a greater chance of effective competition for DSL services.

77. Similarly, line-splitting enables competitors that specialize in voice services to partner with competitors such as Covad that specialize in DSL services. In combination, these competitors are able to offer a complete alternative to the incumbent's telecommunications services, yet neither competitor faces the entry barrier of developing and bearing the cost of the resources necessary to provide two very different types of service.

78. Because line sharing and line splitting eliminate the need for a separate loop for DSL services, they reduce the cost of providing such services. Of course, the incumbents' own approach to offering retail ADSL services has this same cost advantage. Unless other competitors have the same ability to leverage the incumbents' bottleneck local exchange facilities, there will be under far less pressure on the incumbents to ensure that they offer ADSL service in the most cost-effective manner and that they pass those

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[51] *For example*, Dr. Michael A. Carnall acknowledged this point in cross-examination testimony on behalf of Ameritech-Illinois in Illinois Commerce Commission Dockets 00-0313 and 00-0313, hearing

cost savings onto consumers, especially where cable modem services are not available. The incumbents acknowledge that approximately one-quarter of all homes that can receive DSL service do not have a cable modem alternative.[52] The percentage of businesses that do not have a cable alternative to DSL services is undoubtedly much higher, because cable systems are designed to serve residential locations. Line sharing and line splitting foster the competitive pressure needed to deliver the least-cost alternatives for data transport to end users.

1. The Not-So-Special Case of Fiber-Fed Loops

79. The incumbents and others argue that fiber-fed loops present unique issues and should not be subject to mandatory unbundling requirements.[53] They are incorrect. To maintain competitive pressure on the incumbents to be efficient and to pass along the benefits of that efficiency to consumers, the Commission should apply its unbundling requirements to both all-copper and fiber-fed loops. This requirement is necessary for both line-shared and stand-alone loops.

80. Local service (voice and data) provided over fiber-fed loops is part of the same retail market as is local service provided over all-copper loops. At the retail level, consumers are simply concerned with the services they receive. Consumers do not distinguish between all-copper and fiber-fed loops; indeed, they are unlikely to be aware of the type of loop that is used to provide their basic exchange and DSL services.

81. Viewed from the perspective of the wholesale market for facilities to provide Internet access, it is equally true that fiber-fed loops are part of the same geographic and

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Tr. at 984: 12-22.

[52] *UNE Fact Report* at IV-19.

[53] *See*, *e.g.*, SBC Comments at 45.

product market as all-copper loops. Competitors such as Covad must provide reasonably ubiquitous DSL service throughout a metropolitan area if they are to be attractive to the Internet Service Providers ("ISPs") that now purchase most DSL services on behalf of their subscribers. They must be able to provide this service regardless of the type of loop facility that the incumbent has in place.

82. Without a requirement for the incumbents to unbundle fiber-fed loops, competitors such as Covad would be severely impaired in their ability to provide ubiquitous DSL services. The incumbents' "legacy" networks all contain at least some fiber feeder, and at least one incumbent, BellSouth, provides a significant proportion of its regular, voice-grade loops over fiber feeder today. In an ongoing state 271 proceeding in Tennessee, BellSouth has admitted that nearly half of the remote terminal locations at which it has deployed fiber feeder do not have alternative copper facilities available.[54] Thus, competitors such as Covad must have access to the incumbents' fiber-fed loops if they are to provide the kind of broad coverage necessary for efficient entry.

83. Access to only the copper portion of fiber-fed loops via collocation at remote terminals is not a viable substitute for access to fiber-fed loops at the central office. As Anjali Joshi *et al.* have shown, collocation at the remote terminal is prohibitively expensive and is not even technically feasible at many locations.[55] A recent decision of the Wisconsin Public Service Commission ("PSC") supports this conclusion. The Wisconsin PSC found that "[c]ollocation by competitors at remote terminals ('RTs') is

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[54] BellSouth Response to Consolidated CLEC Data Request 80 in Tennessee Regulatory Authority Docket No. 97-00309, *In Re: BellSouth Telecommunications, Inc.'s Entry into Long Distance (interLATA) Service in Tennessee Pursuant to Section 271 of the Telecommunications Act of 1996.*

[55] Joshi *et al*. Declaration at ¶ 40.

costly and time consuming and may present difficulties with space considerations, availability of dark fiber, and completing an engineering controlled splice."[56]

84. For all of these reasons, the Commission should continue to require the incumbents to provide access to the high-frequency portion of the loop as part of the minimum national list of UNEs and should also continue to require the incumbents to offer line splitting. Moreover, the incumbents should provide access to both stand-alone loops and the high-frequency portion of the loop over fiber-fed loops, as well as all-copper loops.

C. Interoffice Transport

85. Geographic market definition is critical to the analysis of whether competitors' ability to enter local markets is impaired without access to unbundled interoffice transport. The transport that Covad seeks is true interoffice transport, *i.e.*, from one ILEC central office to another. Transport between any two other geographic locations is not a substitute for transport between those two points, except insofar as that transport forms part of an alternative route between the two central offices in question.

86. The incumbents assert that "[t]he universe of total competitive fiber—not the point-to-point routes of any individual competitor—defines the geographic areas within which competitive transport facilities are available."[57] This argument presumes that it is readily possible to combine competitive fiber facilities to connect any two points in the general geographic area in which those facilities are provided and that the transactions costs of making such connections are not so high as to constitute competitively

[56] Final Decision of the Wisconsin Public Service Commission in Docket No. 6720-TI-161, *Investigation Into Ameritech Wisconsin's Unbundled Network Elements*, March 21, 2002, at ¶ 67.

[57] *UNE Fact Report* at III-5. *See also* SBC Comments at 87.

significant impairment of entrants such as Covad. The *UNE "Fact" Report* on which the incumbents rely provides no such factual evidence.

87. Instead, the incumbents themselves assert that "[m]any of the competitive transport facilities that CLECs have deployed are used to provide special access services" and that special access "revenues are highly concentrated in a relatively small number of wire centers."[58] These assertions suggest that a substantial proportion of the alternative transport facilities available are concentrated in a small number of wire centers along routes designed to reach from the premises of large customers (or office buildings and industrial parks that permit concentration of high volumes of traffic from multiple smaller customers) to interexchange carrier Points of Presence. It is far from obvious that a competitor such as Covad could readily interconnect such competitive transport facilities to create widespread alternatives to the incumbents' interoffice transport facilities, where the desired point-to-point routes are truly from one ILEC central office to another. Nor is there a scintilla of evidence that the cost of making such arrangements would be *de minimis*.

88. To the contrary, Covad has presented evidence in this proceeding that the incumbent is the only source of transport in at least half of the offices at which Covad is collocated.[59] Even where alternatives to the incumbents' transport exist, these alternatives are sufficiently few for any given route that the prevailing market price is well above cost.[60]

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[58] *UNE Fact Report* at III-8.

[59] Shipley/Chang Declaration at ¶ 18 and Table 1.

[60] *Id.* at ¶¶ 19-22 and Table 2.

89. Moreover, the incumbents' reliance on collocation evidence is suspect because it is likely that a number of the collocators that the incumbents include in their counts are actually bankrupt firms that may not be viable competitors. In the Virginia arbitration proceeding before this Commission, Verizon Virginia admitted in a data response that there were 302 collocation arrangements in Virginia leased by CLECs that are either operating under bankruptcy protection or have declared bankruptcy.[61] This is approximately 30% of the total collocation arrangements that a Verizon witness stated were in place in Virginia as of May, 2001.[62]

90. The Commission should conclude that the incumbents' analysis of transport alternatives is largely irrelevant to the issue of whether true interoffice transport between ILEC central offices should be unbundled because the incumbents do not squarely address the relevant geographic markets. There is simply no evidence of alternatives to ILEC-provided transport between ILEC central offices, much less evidence of sufficient alternatives to make the market for such facilities anything less than highly concentrated. Moreover, the best evidence shows that "committed" entry would be fraught with difficulties. Dr. Clarke of AT&T shows that new entrants face even greater per-line cost disadvantages, on a percentage basis, for interoffice transport than for loops themselves.[63] Thus, interoffice transport should remain a UNE, subject only to possible future determinations (such as in a subsequent triennial review) that a specific point-to-point

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[61] Verizon Virginia Response to AT&T/WCOM 7-98 in CC Docket Nos. 00-218, 00-249, and 00-251.

[62] Direct Testimony of Harold West on behalf of Verizon Virginia in CC Docket Nos. 00-218, 00-249, and 00-251, July 31, 2001, at 3.

[63] Clarke Declaration at ¶¶ 30-32.

route (or other, appropriately defined geographic market) has sufficient alternatives to warrant elimination of the UNE requirement for that particular route or area.

V. Response to Other Arguments Against Mandatory Unbundling

91. Both the incumbents and the D.C. Circuit have advanced several possible arguments against mandatory unbundling other than the claims that such unbundling does not meet the impairment standard of the Act. I address three such arguments below.

A. Mandatory Unbundling at TELRIC-Based Prices Does Not Create Harmful Disincentives for Facilities-Based Competition.

92. The incumbents assert that the Commission's unbundling requirements create disincentives for facilities-based competition.[64] The Commission should recognize the incumbents' alleged concern for promoting facilities-based competition for what it really is—a concern for the well-being of *the incumbents* relative to new entrants buying unbundled network elements. The incumbents' real objection to cost-based pricing of unbundled network elements is that it offers new entrants the opportunity to share in the same wholesale cost advantages that the incumbents already enjoy. Of course, this is precisely the purpose of requiring incumbents to offer unbundled network elements at cost-based prices that reflect the incumbents' economies of scale, scope and connectivity.[65]

93. Any attempt to promote facilities-based entry at the expense of entry via unbundled network elements could actually undermine the ultimate success of facilities-based competition. Ubiquitous facilities-based competition cannot occur overnight or

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[64] *See, e.g.*, SBC Comments at 8.

[65] *Implementation of the Local Competition Provisions in the Telecommunications Act of 1996*, First Report and Order, CC Docket No. 96-98, 11 FCC Rcd. 15499, ¶232 (Aug. 8, 1996).

even over a few years—it is simply too costly and too difficult for new entrants to overbuild the incumbents' entire transmission grid, especially in residential neighborhoods. If the Commission's goal is to create the conditions under which facilities-based competition can succeed in the long run, it should not eliminate unbundling requirements and thereby permit the incumbents to extract monopoly profits in the prices that they charge for UNE functionality at this critical developmental stage of local competition.

94. The Act allows for three entry vehicles—full facilities-based entry, UNE-based entry (which includes facilities-based providers), and total service resale—and does not give precedence to full facilities-based entry over the alternative modes. This agnosticism is far more consistent with economic theory than the notion that full facilities-based competition is always preferable to other forms of competition, which is a total reversal of the presumption over several decades that the local exchange market is a natural monopoly. A natural monopoly is defined as an industry for which a single provider is economically preferred to multiple providers because the cost of providing service through a single provider is the minimum cost to society. Changes in technology appear to have made pure facilities-based competition feasible in some segments of the local exchange market, but it is far from clear that economically efficient facilities-based entry is possible across-the-board.

95. No one knows with certainty what segments of the incumbents' networks are subject to efficient facilities-based competition. But, this Commission and state regulators have conducted a market test of that proposition over the past six years by imposing unbundling requirements and then setting cost-based prices for unbundled

network elements that reflect the incumbents' economies of scale, scope and connectivity. Thus far, the market has decided that full facilities-based entry is economically desirable only in certain, limited settings, such as the provision of high-capacity loop and transport facilities to large businesses in core urban areas.

96. Setting artificially high prices for unbundled network elements, or limiting the elements that will be unbundled, to encourage facilities-based competition without respect to the economic efficiency of full facilities-based entry is bad public policy and bad economics. Contrary to the incumbents' claim, full facilities-based entry is not "superior" to any other form of competition when the cost of full facilities-based entry exceeds the cost to the incumbent of supplying the same functionality.

97. Moreover, as Professor William J. Baumol has written, high prices for access to ILEC facilities could accelerate competitors' commitments to invest in alternative facilities, commitments that require competitors to forego the "options value" of deferring the decision to invest.[66] Ironically, prior to the passage of the Act, concerns about uneconomic bypass[67]—of which this risk is merely an extension—dominated the incumbents' rhetoric about local competition.

98. The incumbents now argue vociferously that the Commission's policies should encourage competitors to invest in their own facilities, rather than to use UNEs. These arguments do not recognize that the facilities-based entry resulting from eliminating access to UNEs at TELRIC-based prices would be uneconomic. Lack of

[66] William J. Baumol, "Option Value Analysis and Telephone Access Charges," in J. Alleman and E. Noam, eds., *The New Investment Theory of Real Options and its Implications for Telecommunications Economics*, 1999, at 218 (hereafter, Baumol, 1999).

[67] The term "uneconomic bypass" refers to a situation in which a potential customer—in this case, the potential UNE purchaser—of a utility's services chooses to "bypass" the utility and obtain the service

access to UNEs may push competitors to build duplicative facilities even where the incumbents have substantial excess capacity and can provide access to UNEs at a far lower social cost than the cost of constructing new facilities. Dr. Baumol observed that:

> [i]t is at least plausible that this sort of overinvestment—the natural extension of uneconomic bypass—is the more likely possibility. And it can indeed occur when some of the options values most likely to be relevant are overlooked.[68]

The relevant options values to which Dr. Baumol is referring are the options values associated with the competitors' investment commitments.

B. Mandatory Unbundling Does Not Sap the Incumbents' Incentives to Invest in New Facilities Such as the Capability to Provide Broadband Services over Fiber-Fed Loops

99. The incumbents take the position that the Commission should not require unbundling of fiber-fed loops because doing so would sap the incumbents' incentive to modernize their networks.[69] To support their contention, they cite to the supposed riskiness of initiatives such as SBC's Project Pronto and claim that mandatory unbundling requirements have jeopardized SBC's investment in that project. A closer look at the history of Project Pronto demonstrates that these claims are false and that the incumbents have, in fact, no evidentiary basis for their broad assertions concerning investment incentives.

100. Those who oppose mandatory unbundling of fiber-fed loops provide a confusing portrayal of the regulatory context in which SBC Communications, Inc.,

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or function in question through self-provisioning or from a third party even though the social cost of the alternative (self-provisioning or third-party service) exceeds the true social cost of the utility's service.

[68] Baumol, 1999, at 218.

[69] *See, for example,* SBC Comments at 8. In addition to the incumbents, the Comments of Corning and the High Tech Broadband Coalition also take this position. Corning Comments at 3; High Tech Broadband Coalition Comments at 28.

reached the corporate decision to invest $6 billion in modernizing the facilities of its incumbent local exchange carrier subsidiaries. These parties fail to acknowledge that, at the time of its internal decision to go forward with Project Pronto, all of the incumbent local exchange carrier subsidiaries of SBC Communications, Inc., had (and continue to have) certain obligations under the Act, including a requirement to provide UNEs to other carriers at prices, terms and conditions that are cost-based and nondiscriminatory.[70]

101. SBC was well aware of these obligations when it considered whether to invest in the network upgrades known collectively as Project Pronto. Indeed, it is a matter of public record that SBC's announcement of its intention to invest $6 billion in these network upgrades throughout its 13-state service territory occurred on October 18, 1999, more than three years after the Act instituted the requirement for incumbents to provide unbundled network elements to competing carriers.

102. Opponents of unbundling such as SBC would have this Commission believe that any application of the Act's unbundling obligations to the modernized loop plant that SBC has been placing in Illinois and elsewhere is a fundamental change in the assumptions under which SBC decided to invest in Project Pronto. They are attempting to rewrite history. For months after SBC as a corporation announced its Project Pronto investment plans, the company's own documents indicate that it expected to have to offer access to those facilities as unbundled network elements.[71] Thus, it is clear that SBC was willing to go forward with this investment even if it had to unbundle the facilities included in the Project Pronto investment plans.

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[70] 47 U.S.C. §252(d)(1).

[71] SBC voluntarily discussed the option of unbundling with carriers such as Covad and referred to UNE access to Project Pronto in documents. *See*, Letter from Paul K. Mancini, SBC Vice-President and Assistant General Counsel, to Lawrence Strickling, Common Carrier Bureau Chief, February 18, 1999.

103. Furthermore, to obtain approval of the merger of SBC and Ameritech, the company agreed with this Commission to provide DSL-based services through an affiliate other than its ILEC operating companies.[72] To obtain a waiver of certain merger conditions, SBC further agreed that it would make its Project Pronto network architecture available to competing carriers on equal terms with its affiliate and at prices that reflect TELRIC.[73] Hence, SBC agreed that it is reasonable to deploy Project Pronto in exchange for TELRIC-based compensation for whatever Project Pronto facilities competitors use to provide DSL-based services.

104. None of these facts regarding SBC's revenue potential (or its costs) for the capabilities that SBC planned to make available as part of Project Pronto are affected in the least by the issue of whether the use of that network is provided under the terms and conditions applicable to UNEs or some other set of regulatory standards. SBC has agreed that all of the compensation its ILEC subsidiaries will receive for Project Pronto facilities, whether used by its advanced services affiliate or by another provider, will be at same level as UNE compensation. This is true even if the company is not required to provide access to Project Pronto facilities as UNEs.

105. The situation I have just described does not change as a result of any unbundling options that this Commission might require SBC to make available for competitors—unless one assumes that state regulators will not competently establish TELRIC-based prices for those additional options. If regulators do set the price for new options at a TELRIC-based price, then SBC will have the same level of net compensation

[72] *SBC/Ameritech Merger Order* at Appendix C, ¶¶ 1-13.

[73] *Application of Ameritech Corp. Transferor, and SBC Communications Inc., Transferee, For Consent to Transfer Contro*l, Second Memorandum Opinion and Order, CC Docket No. 98-141, FCC 00-336, at ¶¶ 25, 48 (rel. Sept. 8, 2000) ("*Project Pronto Modification Order*").

for its efforts that SBC had agreed to in exchange for a limited waiver of the structural separations requirements of the *SBC-Ameritech Merger Order*.

106. Any analysis of the consequences of requiring unbundling of Project Pronto (or similar investment projects of other incumbents) must be based on a clear understanding of the nature of those investments. Unfortunately, SBC seems ready to characterize Project Pronto in any manner that is expedient to its current purpose. SBC witnesses in California have asserted that Project Pronto is simply SBC's decision to start building the very network that it modeled in its own forward-looking cost analysis *prior to the passage of the Act*.[74] That characterization seems far more accurate than any characterization of Project Pronto as a unique initiative relating wholly to advanced services.

107. The primary component of the loop-related portion of Project Pronto is nothing more than an upgrade to fiber feeder and electronics facilities that support both voice and broadband services. Services provided over Project Pronto utilize the exact same distribution facilities as do SBC's "legacy" basic exchange service loops. The fiber feeder deployed in Project Pronto is used to transport the same data and voice traffic that is carried over copper or identical fiber feeder facilities in the "legacy" network. The RTs required are simply the next generation of the electronics assumed in the loop cost

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[74] Specifically, witnesses for SBC's California affiliate, SBC Pacific Bell, alleged in a reciprocal compensation proceeding that Project Pronto is nothing more than SBC's plan to build the forward-looking network that was already contemplated in the unbundled loop cost studies that Pacific Bell had filed as early as 1995. California Public Utilities Commission, Rulemaking 00-02-005, Joint Testimony of Richard L. Scholl and Scott P. Pearsons on Behalf of Pacific Bell [Public Version], July 24, 2000, at 25-26. This statement, if true, implies that the decision to deploy much of the Project Pronto technology has nothing to do with the provision of DSL-based services because the 1995 cost studies that Pacific Bell prepared did not include or explicitly contemplate the provision of DSL-based services.

studies of SBC and other incumbents and already deployed in the "legacy" networks of those incumbent local exchange carriers.

108. This is precisely how SBC itself originally characterized Project Pronto to investors. SBC stated, "[o]f the $6 billion that SBC plans to invest over the next three years, 75 percent will be directed toward improvements to the basic local loop infrastructure (i.e., fiber feeder and next-generation remote terminals)."[75] SBC also stated that "[o]ne-fourth of the $1.8 billion targeted for network efficiency initiatives will be dedicated to upgrading a significant number of locations currently served via copper-based DS1s to new, lower cost fiber facilities. Another 25 percent will be targeted for moving existing voice lines to new fiber-fed remotes."[76] In short, there is nothing radically new and, indeed, little about Project Pronto that was not already anticipated in SBC's own forward-looking loop cost studies prior to the Act other than the cost of the specific line cards that will be used to provide DSL-based services.

109. Project Pronto is basically, as SBC has asserted in California, the implementation of the current engineering standards and up-to-date technology for loop plant. Most of SBC's Project Pronto facilities will be loop plant, comparable to any other loop plant in SBC's network. The same considerations that warrant unbundling of the incumbents' existing loop plant apply to the modernized loop plant that the incumbents intend to place through initiatives such as Project Pronto.

110. SBC's own public statements make it clear that the company should move forward with plans to bring its outside plant up to modern engineering standards regardless of the unbundling requirements that the Commission imposes on Project

[75] SBC Investor Briefing at 2.

Pronto facilities. The Commission should recall the evidence from the SBC Investor Briefing that announced the company's Project Pronto plans. According to that document, SBC is able to fund the $6 billion Project Pronto investment *entirely from operating savings that the investment makes possible*. The briefing treats the new revenues from DSL-based services that Project Pronto makes possible as gravy, albeit very tasty gravy, in terms of justifying SBC's investment decision. It is not credible that any of the SBC operating companies would eschew a self-financing investment that has the cost-saving characteristics alleged on behalf of Project Pronto simply because the company is compelled to fulfill regulatory obligations that it fully anticipated at the time it made its investment decisions. Instead, SBC should deploy most, if not all, of the capabilities of Project Pronto as a means of capturing significant operating savings for the services that the company currently offers in its 13-state region.

111. SBC's positions in this docket seem like a concerted effort to back out of its commitments to the Commission, rather than a reaction to any impediment to the company's efficient deployment of new technology. Certainly, authorization to exempt key strategic portions of SBC's loop plant from UNE regulations and to narrow any potential competition for DSL-based service is entirely inconsistent with the logic that led the FCC to condition approval of the SBC-Ameritech merger on the creation of a separate broadband services affiliate.

112. Furthermore, the distinction that SBC and others are trying to draw between "new" investment, which they claim should not be subject to unbundling requirements, and "old" investment in legacy networks is spurious. The only reason that

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[76] *Id.* at 6-7.

SBC can deploy loop facilities designed to bring DSL capability to at least 80% of the customers in its 13-state region[77] for approximately $4 billion, including the cost of installing new fiber feeder, is that the company already has in place ubiquitous distribution plant, supporting structure such as poles and conduit and numerous other facilities, including upgradeable RTs, that were built to provide narrowband telecommunications services to its monopoly basic exchange customers. Moreover, the only reason that SBC can finance the entire $6 billion Project Pronto investment out of savings in operating expenses and otherwise-required capital outlays is that the company retains, as a legacy of its previous exclusive franchise, nearly-100% control of the narrowband basic exchange services provided over its existing loop facilities.

113. Congress recognized that such incumbency advantages would give carriers such as SBC an unfair edge in newly opened local exchange markets. That is why Congress determined that incumbent local exchange carriers must provide unbundled network elements under prices, terms and conditions that are explicitly designed to eliminate the basis for such an unfair advantage. In other words, Congress has determined that the public interest in the development of truly competitive markets for local telecommunications services outweighs the private interest of companies such as SBC in maintaining unfettered control over their privately owned facilities.[78] This Commission should make unbundling decisions that are consistent with that

[77] SBC Investor Briefing at 4. Only 75% of the $6 billion for Project Pronto, or approximately $billion, is for upgrading loop plant to make it DSL-capable. *Id* at 2.

[78] The requirements of the Act are not one-sided, however. Fulfillment of Congress's unbundling requirements is one of the checklist items that positions SBC eventually to offer in-region interLATA services, an opportunity that was heretofore unavailable to the company.

Congressional mandate and disregard the incumbents' proposed distinction between "new" and "old" investments.

C. Cross-Subsidy Concerns Do Not Justify the Elimination of Unbundling Requirements

114. In yet a third argument against mandatory unbundling, the D.C. Circuit opinion states that this Commission ought to have considered the effects of state-mandated cross-subsidies for local exchange services in its impairment analysis.[79] Not only does the D.C. Circuit opinion rest on evidence of dubious quality concerning the extent of cross-subsidization, it also fails to recognize the Act's requirement for explicit universal service subsidies, the existence of explicit universal service funding and the Supreme Court's affirmation of this Commission's TELRIC pricing methodology, which specifically rules out consideration of subsidies for universal service.

115. Both the Act and this Commission's policies support the promotion of competition in all telecommunications markets. Reliance on implicit subsidies from above-cost pricing of certain services to support below-cost pricing of other services is fundamentally incompatible with a competitive market paradigm.[80] To preserve the ability to offer targeted services below cost, both this Commission and state regulators have placed increasing emphasis on explicit subsidy mechanisms, such as the federal universal service fund and intrastate universal service funds in states such as California.

116. For example, the California Public Utilities Commission created an intrastate universal service fund to eliminate the need to obtain subsidies from other telecommunications services to support residential basic local exchange service. As the

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[79] *USTA*, 290 F.3d at 422-423.

California Commission stated in its order adopting the intrastate fund ("D.") 95-07-050, "the [universal service] subsidy needs to be explicit and separate from the LECs' existing rate structure."[81]

117. The suggestion that UNE-based competition would undermine the cross-subsidies necessary to support universal service is not borne out by most recent available forward-looking cost evidence for retail services provided in California. In testimony before the California Commission, a Pacific Bell employee described a series of tests that he had performed using the company's adopted forward-looking costs to determine whether Pacific Bell's services were cross-subsidized. His testimony showed that all Pacific services and families of services generated sufficient revenues to recover their forward-looking economic costs, including so-called "shared and common" costs, except for a small number of services that individually did not recover their service-specific forward-looking economic costs.[82] In reviewing that testimony, I was able to demonstrate that the shortfall in recovery of service-specific costs was less than the combined total of the subsidy that Pacific Bell receives from the California intrastate universal service fund plus the contribution that Pacific Bell receives from the net revenues from its Yellow Pages product.[83] (The California Commission is required by state statute to consider the net revenues from Yellow Pages in setting rates for other Pa-

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[80] *See, for example,* 47 U.S.C. § 254, and *In the Matter of Federal-State Joint Board on Universal Service*, Report and Order, CC Docket No. 96-45, FCC 97-157 (rel. May 8, 1997).

[81] California Public Utilities Commission Decision ("D.") 95-07-050, July 19, 1995, *slip op.* at 34.

[82] Direct Testimony of Richard L. Scholl on behalf of Pacific Bell in California Public Utilities Commission docket nos. R.93-04-003/I.93-04-002, April 8, 1998, at 6.

[83] Rebuttal Testimony of Terry L. Murray in California Public Utilities Commission dockets R.93-04-003/I.93-04-002, April 27, 1998, at 32-33.

cific Bell telecommunications services.)[84] Those revenues are available to recover any shortfall in cost recovery from basic exchange or other targeted services.) The record in California thus clearly establishes that Pacific Bell does not require revenues from any source other than the California intrastate universal service fund and Yellow Pages to subsidize below-cost provisioning of its retail services.

118. Moreover, Pacific Bell's cross-subsidy analysis rested on a comparison of local exchange revenues with forward-looking cost estimates that far exceed the efficient cost of providing local telecommunications services today. The California Commission recently adopted interim prices for unbundled voice-grade loops, local switching and tandem switching that are 15.1%, 69% and 79%, respectively, lower than the UNE prices that the California Commission had adopted in 1999, which reflected the same vintage of cost data as were used in the Pacific Bell retail service cost studies on which the cross-subsidy analysis was based. Such precipitous declines in forward-looking costs for loops and switching should translate into comparable declines for the cost of basic service, and thus to significant reductions in the extent (if any) to which basic service requires a subsidy.

119. These declines in forward-looking costs, and concomitant declines in the extent (if any) of subsidies required for basic service, are not unique to California. Information presented in several recent state cost proceedings, notably dockets with

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[84] Cal. Pub. Util. Code § 728.2. The full text of the statute reads, in relevant part:

> § 728.2. Telephone directories and advertising
> (a) Except as provided in subdivision (b) the commission shall have no jurisdiction or control over classified telephone directories or commercial advertising included as part of the corporation's alphabetical telephone directories, including the charges for and the form and content of such advertising, *except that the commission shall investigate and consider revenues and expenses with regard to the acceptance and publication of such advertising for purposes of establishing rates for other services offered by telephone corporations.* (Emphasis added).

which I am familiar in Florida and the former Ameritech states, supports a conclusion that the forward-looking economic cost of the primary components of basic service, such as the loop and switching, has declined significantly in recent years.

120. Thus, the D.C. Circuit opinion rests on two mistaken premises. First, to the extent that basic service requires a subsidy, there are both state and federal programs that supply explicit subsidy funds to bridge the gap between the incumbents' regulated rates for local exchange service and the forward-looking cost of providing that service. Therefore, there is no justification to prohibit access to UNEs as a means of preserving the incumbents' source of universal service funding support.[85]

121. Second, there is every reason to believe that the extent of subsidies between customer classes is far lower than the D.C. Circuit seems to assume, and that the need to subsidize basic service is declining in tandem with the rapid decline in forward-looking costs for the network functionalities needed to provide basic service. For both of these reasons, the Commission should give no weight to cross-subsidy concerns in determining whether to require unbundling.

VI. Summary and Conclusion

122. In summary, when one applies standard economic analysis as embodied in the *Merger Guidelines* to the evidence in this proceeding, it becomes evident that the current degree of market power possessed by the incumbents is so great that the Commission must continue to impose mandatory unbundling requirements if there is to be any hope of widespread competition for broadband services. Moreover, retention of a

[85] This conclusion holds with particular force for line-sharing. The incumbents did not provide DSL services prior to the passage of the Act and thus could not have depended upon the "contribution" from such services to subsidize basic local service.

national list of UNEs would avoid serious market disruption with the attendant harms to consumers.

123. Rather than eliminate any UNEs at this time, the Commission should consider the adoption of an "exit strategy" based on the *Merger Guidelines* that would allow states, beginning at some fixed point in the future, to entertain applications to "delist" UNEs in specific geographic markets for which the incumbents make a *prima facie* showing that the relevant market is not highly concentrated (*i.e.*, has at least four current participants and a total of at least six current and potential competitors). To the extent that potential competitors face significant sunk costs, the incumbents' *prima facie* showing must include evidence that "committed" entry passes the three-step *Merger* Guidelines test. Upon further investigation, states could "delist," subject to final review by the FCC, non-bottleneck UNEs in those markets if the market is neither a highly concentrated market nor a moderately concentrated market in which other considerations dictate preserving access to UNEs. Any UNEs "delisted" at the state level must be subject to grandfathering requirements designed to avoid market disruption. This approach is responsive to the D.C. Circuit opinion, but also consistent with the important pro-competitive goals of the Act and this Commission.

124. This concludes my declaration.

I declare under penalty of perjury that the foregoing is true and correct. Executed on July 17, 2002.

____/s/ Terry L. Murray____
Terry L. Murray

Terry L. Murray

President, Murray & Cratty, LLC
January 1998 - present
Economic consulting and expert witness testimony specializing in regulatory and antitrust matters.

Principal, Murray and Associates
April 1992 - December 1997
Economic consulting and expert witness testimony, primarily in the fields of telecommunications, energy and insurance regulation and antitrust.

Director, Regulatory Economics, Morse, Richard, Weisenmiller & Associates, Inc.
April 1990 - April 1992
Economic consulting and expert witness testimony, primarily in the fields of telecommunications and energy regulation.

California Public Utilities Commission
June 1984 - March 1990

Director, Division of Ratepayer Advocates (DRA)
March 1989 - March 1990
Headed a staff of over 200 analysts who provided expert witness testimony on behalf of California ratepayers in contested proceedings involving telecommunications, electric, gas, water and transportation utilities. Major proceedings included evaluation of proposed merger between Southern California Edison and San Diego Gas and Electric Companies.

Program Manager, Energy Rate Design and Economics Branch, DRA
October 1987 - March 1989
Managed a staff of over 30 analysts who testified on electric and gas rate design and costing issues, sales forecasts and productivity analyses. Testified as lead policy witness in electric utility incentive ratemaking and transportation policy proceedings.

Senior Policy Analyst, Policy and Planning Division
March 1987 - October 1987
Organized *en banc* hearing and drafted notice of investigation for major telecommunications incentive regulation proceeding. Headed Commission task force on open network architecture.

Commissioner's Advisor
July 1985 - March 1987
Lead advisor on independent power industry and cost of capital issues. Analyzed proposed decisions on energy, telecommunications, water and transportation issues and made recommendations for Commission action. Co-authored Commission order establishing conditions for approval of San Diego Gas and Electric Company application to form a holding company.

Staff Economist, Public Staff Division
June 1984 - July 1985
Testified on cost of capital and telecommunications bypass issues. Served on telecommunications strategy task force charged with developing recommendations for post-divestiture regulatory policies.

Instructor, Golden Gate University
1986 - 1987
Taught courses on telecommunications regulation to students in the Masters in Telecommunications Management program and students in a special program for federal government telecommunications managers.

Acting Assistant Professor of Economics, Wesleyan University
July 1981 - June 1982
Taught undergraduate courses in microeconomics, macroeconomics, econometrics, and economics and policy of regulation.

TESTIMONY

A. California Department of Insurance

- File Nos. PA-94-0012-00 & PA-94-0012-0A, In re 20th Century Insurance Company and 21st Century Casualty Company.
- File Nos. PA-93-0014-00 *et al.*, In the Matter of the Rates and Rating Practices, and Rate Applications of: State Farm Mutual Automobile Insurance Company, State Farm Fire and Casualty Company, State Farm General Insurance Company, Applicants and Respondents, 3/1/94, 3/29/94.
- File Nos. PA-93-0009-00 *et al.*, In the Matter of the Rate Applications of Nationwide Mutual Insurance Company, Nationwide Mutual Fire Insurance Company, Nationwide Property and Casualty Insurance Company, Applicants, 9/11/93.

B. California Public Utilities Commission

- R.01-09-001/ I.01-09-002, Orders Instituting Rulemaking/Investigation on the Commission's Own Motion to Assess and Revise the New Regulatory Framework for Pacific Bell and Verizon California Incorporated, 6/21/02.
- R.93-04-003/I.93-04-002, Rulemaking and Investigation on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish and Framework for Network Architecture Development of Dominant Carrier Networks, and R. 95-04-043/I.95-04-044, Rulemaking and Investigation on the Commission's Own Motion into Competition for Local Exchange Service (consolidated for purposes of evaluating Pacific Bell's Section 271 application), 8/23/01.
- A.01-02-024, Joint Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Switching in Its First Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99-11-050, and A.01-02-035, Application of AT&T Communications of California, Inc. (U 5002 C) and WorldCom, Inc. for the Commission to Reexamine the Recurring Costs and Prices of Unbundled Loops in Its First Annual Review of Unbundled Network Element Costs Pursuant to Ordering Paragraph 11 of D.99 11-050, 8/20/01.

- A.01-01-010, Application by Pacific Bell Telephone Company (U 1001 C) for Arbitration of an Interconnection Agreement with MCImetro Access Transmission Services, L.L.C. (U 5253 C) Pursuant to Section 252(b) of the Telecommunications Act of 1996,. 2/2/01.
- A.00-01-022, Application of AT&T Communications of California, Inc., *et al*., for Arbitration of an Interconnection Agreement with Pacific Bell Pursuant to Section 252(b) of the Telecommunications Act of 1996, 1/24/00, 3/5/00.
- A.00-01-012, In the Matter of Covad Communications Company's (U 5752 C) Petition for Arbitration of Interconnection Agreement with Roseville Telephone Company (U 1015 C), 1/7/00.
- A.98-12-005, In the Matter of the Joint Application of GTE Corporation ("GTE") and Bell Atlantic Corporation ("Bell Atlantic") to Transfer Control of GTE's California Utility Subsidiaries to Bell Atlantic Which Will Occur Indirectly as a Result of GTE's Merger with Bell Atlantic, 6/7/99.
- A.99-03-047, In the Matter of the Petition by Pacific Bell (U 1001 C) for Arbitration of an Interconnection Agreement with Metropolitan Fiber Systems/ Worldcom Technologies, Inc. (MFS/Worldcom) Pursuant to Section 252(b) of the Telecommunications Act of 1996, 4/16/99, 5/24/99.
- A.98-05-038, In the Matter of the Application of Pacific Bell for Authority for Pricing Flexibility and to Increase Certain Operator Services, to Reduce the Number of Monthly Directory Assistance Call Allowances, and Adjust Prices for Four Centrex Optional Features, 11/17/98.
- A.98-06-052, In the Matter of the Petition of PDO Communications, Inc. for Arbitration Pursuant to Section 252 of the Federal Telecommunications Act of 1996 to Establish an Interconnection Agreement with Pacific Bell, 8/14/98.
- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (re: GTE California, Inc.), 9/96.
- A.96-04-038, In the Matter of the Joint Application of Pacific Telesis Group and SBC Communications, Inc. for SBC to Control Pacific Bell, 9/30/96.
- A.93-03-054, Application to Modify Diablo Canyon Pricing and Adopt a Customer Electric Rate Freeze in Compliance with Decision 95-12-063, 9/9/96.
- R.93-04-003/I.93-04-002, Rulemaking and Investigation on the Commission's Own Motion to Govern Open Access to Bottleneck Services and Establish and Framework for Network Architecture Development of Dominant Carrier Networks, 6/14/96, 7/10/96, 3/18/97, 12/19/97, 2/11/98, 4/8/98, 4/27/98, 5/1/98, 6/5/98, 12/18/98, 1/11/99, 2/8/99, 3/15/00, 3/27/00, 4/5/00, 5/2/00, 6/11/01, 6/25/01, 7/24/01.
- I.95-04-044, Order Instituting Investigation on the Commission's Own Motion into Competition for Local Exchange Service, 10/2/95, 10/9/95, 12/95.
- I.94-04-032, Order Instituting Investigation on the Commission's Proposed Policies Governing Restructuring California's Electric Services Industry and Reforming Regulation, 12/8/94.
- Application Nos. 93-05-008 *et al.*, In the Matter of the Application of Sierra Pacific Power Company to Authorize a Return on Equity for Calendar Year 1994 Pursuant to Attrition Rate Adjustment Mechanism, 8/93.
- Application Nos. 92-05-002 and 92-05-004, Application of GTE California Incorporated for Review of the Operations of the Incentive-Based Regulatory Framework Adopted in Decision 89-10-031, 5/93, 7/93.
- Case No. 91-12-028, The City of Long Beach, in its Proprietary Capacity and as Trustee for the State of California, Complainant, vs. Unocal California Pipeline Company, a Unocal Company, Defendant, 5/15/93.

- I.87-11-033 *et al.*, In the Matter of Alternative Regulatory Frameworks for Local Exchange Carriers (Phase III, Implementation and Rate Design), 9/23/91, 12/16/91, 1/17/92.
- General freight deregulation proceeding, 10/88.
- I.86-10-001, Risk, Return and Ratemaking, 3/88.
- Southwest Gas General Rate Case, 8/85.
- Application No. 85-01-034, Pacific Bell Test Year 1986 General Rate Case, 4/22/85.
- CP National South Lake Tahoe Gas General Rate Case, 12/84.

C. Colorado Public Service Commission

- Docket No. 91A-480EG, In the Matter of the Joint Application of the Parties to Revised Settlement Agreement II in Docket Nos. 91S-091EG and 90F-226E for Commission Consideration of Decoupling Revenues from Sales and Establishment of Regulatory Incentives to Encourage the Implementation of DSM Programs, 11/8/91, 4/30/92, 9/8/92, 9/14/92.

D. Connecticut Department of Public Utility Control

- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (with The Southern New England Telephone Company), 12/96.
- Docket Nos. 95-06-17 *et al.*, Application of The Southern New England Telephone Company for Approval to Offer Unbundled Loops, Ports and Associated Interconnection Arrangements, 9/8/95.

E. Delaware Public Service Commission

- Docket No. 96-324, Bell Atlantic - Delaware Statement of Terms and Conditions Under Section 252(F) of the Telecommunications Act of 1996, 2/4/97.
- Docket No. 45, In the Matter of the Development of Regulations for the Facilitation of Competitive Entry into the Telecommunications Local Exchange Service Market, 7/3/96.

F. District of Columbia Public Service Commission

- Formal Case No. 962, In the Matter of the Implementation of the District of Columbia Telecommunications Act of 1996 and Implementation of the Telecommunications Act of 1996, 3/24/97, 5/2/97, 5/9/97, 1/11/02.

G. Federal Communications Commission

- File No. EB-02-MD-017, WorldCom, Inc., Complainant, v. Verizon New England Inc., Bell Atlantic Communications, Inc. (d/b/a Verizon Long Distance), NYNEX Long Distance Company (d/b/a Verizon Enterprise Solutions), and Verizon Global Networks, Inc., Defendants, 5/7/02.
- CC Docket Nos. 00-218, 00-249 and 00-251, In the Matter of the Petition of WorldCom, Inc., Pursuant to Section 252(e)(5) of the Communications Act for Expedited Preemption of the Jurisdiction of the Virginia State Corporation Commission Regarding Interconnection Disputes with Verizon Virginia, Inc., and for Expedited Arbitration, *et al.*, 7/31/01, 8/27/01, 9/21/01.

- File No. E-98-12, MCI Telecommunications Corp. and MCImetro Access Transmission Services, Inc., Complainants, v. Bell Atlantic Corp., Defendant, 12/19/97, 3/25/98.
- CC Docket No. 94-1, In the Matter of Price Cap Performance Review for Local Exchange Carriers, 6/29/94.
- W-P-C 6913 *et al.*, In re the Matter of the Application of Pacific Bell for Authority Pursuant to Section 214 of the Communications Act of 1934, and Section 63.01 of the Commission's Rules and Regulations to Construct and Maintain Advanced Telecommunications Facilities to Provide Video Dialtone Services to Selected Communities.

H. Florida Public Service Commission

- Docket No. 990649-TP, In re: Investigation into the Pricing of Unbundled Network Elements, 8/11/99, 9/10/99, 10/15/99, 6/8/00, 7/31/00, 8/28/00.
- Docket No. 930424-EI, In re: Request for Approval of Proposal for Incentive Return on Demand-Side Management Investments by Florida Power Corporation, 11/22/93.
- Docket No. 93-444-EI, In re: Request for Approval of Proposal for Revenue Decoupling by Florida Power Corporation, 11/22/93.

I. Georgia Public Service Commission

- Docket No. 11900-U, In re: Investigation of BellSouth Telecommunications, Inc.'s Provision of Unbundled Network Elements for xDSL Service Providers, 11/13/00, 12/20/00.

J. Hawaii Public Service Commission

- Docket No. 7702, In the Matter of Public Utilities Commission Instituting a Proceeding on Communications, Including an Investigation of the Communications Infrastructure of the State of Hawaii, 7/3/97, 8/29/97, 6/2/00.

K. Illinois Commerce Commission

- Docket No. 00-0393, Illinois Bell Telephone Company Proposed Implementation of High Frequency Portion of Loop (HFPL) / Line Sharing Service, 9/1/00, 9/20/00, 10/4/00.
- Docket Nos. 00-0312 and 00-0313, Petitions of Covad Communications Company and Rhythms Links Inc. for Arbitration Pursuant to Section 252(b) of the Telecommunications Act of 1996 to Establish an Amendment for Line Sharing to the Interconnection Agreement with Illinois Bell Telephone Company d/b/a Ameritech Illinois, and for an Expedited Arbitration Award on Certain Core Issues, 5/15/00, 6/22/00, 11/21/00, 12/12/00, 12/21/00, 7/13/00.
- Docket No. 98-0396, Investigation into the Compliance of Illinois Bell Telephone Company with the Order in Docket 96-0486/0569 Consolidated Regarding the Filing of Tariffs and the Accompanying Cost Studies for Interconnection, Unbundled Network Elements and Local Transport and Termination and Regarding End to End Bundling Issues, 3/29/00, 5/5/00, 7/12/00.
- Docket No. 99-0593, Investigation of Construction Charges, 2/17/00, 3/8/00, 3/22/00.
- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (Ameritech – Illinois), 12/96.

L. Kansas Corporation Commission

- Docket No. 00-DCIT-997-ARB, In the Matter of the Petition of Covad Communications Company for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements for Line Sharing with Southwestern Bell Telephone Company, 6/12/00.
- Docket No. 00-DCIT-389-ARB, In the Matter of the Petition of DIECA Communications, Inc. d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements with Southwestern Bell Telephone Company, 1/7/00, 1/25/00, 2/21/00.
- Docket Nos. 190, 192-U, In the Matter of a General Investigation into Competition within the Telecommunications Industry in the State of Kansas, 11/14/94.

M. Maryland Public Service Commission

- Case No. 8921 – In the Matter of the Review by the Commission into Verizon Maryland Inc.'s Compliance with the Conditions of 47 U.S.C. § 271(c), 7/15/02.
- Case No. 8879 – In the Matter of the Investigation into Rates for Unbundled Network Elements Pursuant to the Telecommunications Act of 1996, 5/25/01, 9/5/01, 10/15/01.
- Case No. 8745 – In the Matter of the Provision of Universal Service to Telecommunications Consumers, 5/21/01, 6/11/01.
- Case No. 8842 – In the Matter of Rhythms Links Inc. and Covad Communications Company vs. Bell Atlantic-Maryland, Inc., pursuant to Section 252(B) of the Telecommunications Act of 1996, 5/5/00, 7/14/00, 10/27/00.
- Case No. 8820, In the Matter of the Investigation into Affiliated Activities, Promotional Practices and Codes of Conduct of Regulated Gas and Electric Companies, 10/1/99, 10/26/99, 12/10/99.
- Docket No. 8797, In the Matter of The Potomac Edison Company's Proposed: (a) Stranded Cost Quantification Mechanism; (b) Price Protection Mechanism; (c) and Unbundled Rates, 1/26/99.
- Docket No. 8795, In the Matter of Delmarva Power and Light Company's Proposed Stranded Cost Quantification Mechanism, Price Protection Mechanism, and Unbundled Rates, 12/28/98.
- Docket No. 8794, In the Matter of Baltimore Gas and Electric (BGE)'s Proposed Stranded Cost Quantification Mechanism, Price Protection Mechanism, and Unbundled Rates, 12/22/98, 7/23/99, 8/3/99.
- Docket No. 8786, In the Matter of the Investigation of Non-Recurring Charges for Telecommunications Interconnection Service, 5/27/98, 11/16/98, 12/18/98.
- Docket No. 8731, Phase II, In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising Under §252 of the Telecommunications Act of 1996, 3/7/97.
- Case No. 8731, In the Matter of the Petitions for Approval of Agreements and Arbitration of Unresolved Issues Arising under Section 252 of the Telecommunications Act of 1996, 10/96.
- Case No. 8715, In the Matter of the Inquiry into Alternative Forms of Regulating Telephone Companies, 11/95, 4/1/96.

N. Massachusetts Department of Telecommunications and Energy

- Docket No. DTE 98-57, Investigation by the Department on its own motion as to the propriety of the rates and charges set forth in the following tariffs: M.D.T.E. Nos. 14 and

17, filed with the Department on April 2, 1999, to become effective May 2, 1999, by New England Telephone and Telegraph Company d/b/a Bell Atlantic – Massachusetts, 7/26/99, 11/9/99.

O. Michigan Public Service Commission

- Case No. U-12540, In the Matter of the Application of Ameritech Michigan for Approval of Cost Studies and Resolution of Disputed Issues Related to Certain New UNE Offerings, 9/15/00, 10/13/00.
- Case No. U-10755, In the Matter of the Application of Consumers Power Company for Authority to Increase Its Rates for the Sale of Natural Gas and for Other Relief, 6/9/95.
- Case No. U-10685, In the Matter of the Application of Consumers Power Company for Authority to Increase Its Rates for the Sale of Electricity, 3/29/95, 5/5/95.
- Case No. U-10647, In the Matter of the Application of City Signal, Inc., for an Order Establishing and Approving Interconnection Arrangements with Michigan Bell Telephone Company, 8/5/94, 11/7/94, 11/30/94.

P. Minnesota Public Utilities Commission

- PUC Docket No. P-421/CI-01-1371, In the Matter of a Commission Investigation into Qwest's Compliance with Section 272(c)(2)(B) of the Telecommunications Act of 1996; Checklist Items 1.2, 4, 5, 6, 11, 13, and 14, 6/10/02.
- PUC Docket No. P-421/CI-01-1370, In the Matter of a Commission Investigation into Qwest's Compliance with Section 272(c)(2)(B) of the Telecommunications Act of 1996; Checklist Items 3, 7, 8, 9, 10 and 12, 1/28/02, 2/22/02.

Q. Missouri Public Service Commission

- Case No. TO-2001-439, In the Matter of the Determination of Prices, Terms, and Conditions of Conditioning for xDSL-Capable Loops, 6/22/01, 7/13/01.
- Case No. TO-2000-322, In the Matter of the Petition of DIECA Communications, Inc. d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms, Conditions and Related Arrangements with Southwestern Bell Telephone Company, 1/7/00, 1/27/00, 2/10/00.

R. Nevada Public Service Commission

- In re a Petition of the Staff of the Public Utilities Commission to Open a Docket to Investigate Costing and Pricing Issues Related to Industry-Wide Collocation Costs Pursuant to the Telecommunications Act of 1996 and the Commission's Regulations, 11/3/00.
- Docket No. 96-9035, In re a Petition by the Regulatory Operations Staff to Open an Investigation into the Procedures and Methodologies that Should Be Used to Develop Costs for Bundled or Unbundled Telephone Services or Service Elements in the State of Nevada, 5/8/97, 5/23/97.

S. New Jersey Board of Public Utilities

- Docket No. TO00060356, In the Matter of the Board's Review of Unbundled Network Elements Rates, Terms and Conditions of Bell Atlantic – New Jersey, 10/12/00.
- Docket No. TX95120631, Notice of Investigation into Local Exchange Competition for Telecommunications Services, 8/30/96, 12/20/96.

T. New York Public Service Commission

- Case No. 98-C-1357, Proceeding on Motion of the Commission to Examine New York Telephone Company's Rates for Unbundled Network Elements, 9/23/99, 10/18/99, 10/22/99, 2/7/00, 2/22/00, 3/31/00, 4/17/00, 6/26/00, 10/19/00, 11/13/00.
- Case Nos. 94-E-0098 and 94-E-0099, Niagara Mohawk Fuel Adjustment Clause Target and S.C. 6 Update Filing, 11/17/95.
- Case Nos. 93-E-0912 and 93-E-1075, Proceeding on Motion of the Commission to Review Long-Run Avoided Cost Estimation Policies and Methods, 5/10/95, 5/31/95.
- Case Nos. 92-E-1055 and 92-G-1056, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations for Central Hudson Gas & Electric Company for Electric Service and Gas Service, respectively, 3/93.
- Case Nos. 92-E-0108 *et al.*, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Niagara Mohawk Power Corporation for Electric Service, 1992.
- Case Nos. 91-E-0863 *et al.*, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of New York State Electric & Gas Corporation for Electric Service, 1/92.
- Case Nos. 91-E-0765 *et al.*, Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Rochester Gas & Electric Corporation for Electric Service, 11/91.
- Case No. 91-E-0506, Proceeding on Motion of the Commission as to the Rates, Charges, Rules, and Regulations for Central Hudson Gas & Electric Company for Electric Service, 9/91, 10/91.
- Case Nos. 29327 *et al.*, Niagara Mohawk Power Corporation Financial Recovery Agreement proceeding, 3/91.
- Docket No. 89-E-176, In the Matter of the Proceeding on Motion of the Commission to Examine Ratemaking Practices and Incentive Mechanisms Promoting Least-Cost Planning and Demand-Side Management by Electric Utilities, 4/19/90, 5/4/90, 4/18/91, 6/20/91.

U. North Carolina Utilities Commission

- Docket Nos. P-7, Sub 825, and P-10, Sub 479, In the Matter of Petition of Carolina Telephone and Telegraph and Central Telephone Company for Approval of a Price Regulation Plan Pursuant to G. S. 62-133.5, 1/31/96.
- Docket No. P-55, Sub 1013, In the Matter of Application of BellSouth Telecommunications, Inc., for, and Election of, Price Regulation and Motion for a Hearing, 1/28/96, 2/1/96.

V. Ohio Public Utilities Commission

- Case No. 96-922-TP-UNC, In the Matter of the Review of Ameritech Ohio's Economic Costs for Interconnection, Unbundled Network Elements, and Reciprocal Compensation for Transport and Termination of Local Telecommunications Traffic, 10/6/00.

W. Oklahoma Corporation Commission

- Cause No. PUD 200000192, Applicant: Southwestern Bell Telephone Company; Relief Sought: Approval of Nonrecurring Rates for Conditioning Unbundled Digital Subscriber Line ("DSL") Capable Loops, 7/12/00, 8/1/00.

X. Oregon Public Utility Commission

- Case No. UM-731, Phase IV, In the Matter of the Investigation of Universal Service in the State of Oregon, 1/17/00.

Y. Pennsylvania Public Utility Commission

- Docket No. R-00016683, Generic Investigation of Verizon Pennsylvania, Inc.'s Unbundled Network Element Rates, 12/7/01, 1/11/02, 2/8/02.
- Docket No. M-00001353, Re Structural Separation of Verizon-Pennsylvania Inc. Wholesale and Retail Operations, 10/10/00.
- Docket No. R-00005261, In re: Further Pricing of Bell Atlantic Pennsylvania, Inc.'s Unbundled Network Elements, 10/4/00.
- Docket Nos. R-00994697 and R-994697C0001, Pennsylvania Public Utility Commission v. Bell Atlantic – Pennsylvania, Inc./ Rhythms Links Inc., Complainant v. Bell Atlantic – Pennsylvania, Inc., Respondent, 12/21/99, 1/14/00.
- Docket Nos. P-00991648, Joint Application of NEXTLINK Pennsylvania, Inc., *et al.* and P-00991649, Joint Application of Bell Atlantic – Pennsylvania, Inc., *et al.*, 4/22/99, 6/11/99.
- Docket Nos. A-310200F0002 *et al.*, In re the Joint Application of Bell Atlantic Corporation and GTE Corporation for Approval of Agreement and Plan of Merger, 3/23/99, 5/19/99.
- Docket No. I-00960066, Generic Investigation of Intrastate Access Charge Reform, 6/30/97, 7/29/97, 8/27/97.
- Docket No. A-31023670002, In the Matter of the Application of MCI Metro Access Transmission Services, Inc. for a Certificate of Public Convenience and Necessity to Provide and Resell Local Exchange Telecommunications Services in Pennsylvania, 9//96.
- Petition for Arbitration by AT&T-PA for an Interconnection Agreement with GTE-PA, 9/96.
- Petition for Arbitration by Eastern TeleLogic for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Petition for Arbitration by AT&T-PA for an Interconnection Agreement with Bell Atlantic - Pennsylvania, 9/96.
- Docket No. I-940035, Formal Investigation to Examine and Establish Updated Universal Service Principles and Policies for Telecommunications Services, 1/11/96, 2/14/96, 2/27/96.
- Docket No. A-310203F002, Application of MFS Intelenet of Pennsylvania, Inc., for Approval to Operate as a Local Exchange Telecommunications Company, 1/30/95, 2/22/96, 3/22/96, 1/13/97, 2/97.

Z. South Carolina Public Service Commission

- Docket No. 95-720-C, Application of BellSouth Telecommunications, Inc. d/b/a Southern Bell Telephone and Telegraph Company for Alternative Regulation, 8/21/95, 9/11/95.
- Docket No. 95-862-C, Re: BellSouth Telecommunications, Inc. d/b/a Southern Bell Telephone and Telegraph Company Investigation of Level of Earnings, 8/21/95, 9/11/95.

AA. Tennessee Regulatory Authority

- Docket No. 97-00309, In Re: BellSouth Telecommunications, Inc.'s Entry into Long Distance (interLATA) Service in Tennessee Pursuant to Section 271 of the Telecommunications Act of 1996, 7/11/02.

BB. Texas Public Utility Commission

- Docket Nos. 22168, Petition of IP Communications Corporation to Establish Public Utility Commission of Texas Oversight Concerning Line Sharing Issues and 22469, Complaint of Covad Communications Company and Rhythms Links, Inc. against Southwestern Bell Telephone Company and GTE Southwest Inc. for Post-Interconnection and Arbitration under the Telecommunications Act of 1996 Regarding Rates, Terms, Conditions and Related Arrangements for Line-Sharing, 5/17/00, 9/5/00 (rev. 10/6/00), 10/20/00.
- Docket Nos. 20226, Petition of Accelerated Connections, Inc. d/b/a ACI Corp. for Arbitration to Establish an Interconnection Agreement with Southwestern Bell Telephone Company, and 20272, Petition of DIECA Communications, Inc., d/b/a Covad Communications Company for Arbitration of Interconnection Rates, Terms and Conditions and Related Arrangements with Southwestern Bell Telephone Company, 2/19/99, 4/8/99.

CC. Vermont Public Service Board

- Docket No. 5780, Green Mountain Power Company General Rate Case, 1/13/95.
- Docket No. 5695, Tariff Filing of Green Mountain Power Company Requesting an 8.60% Rate Increase to Take Effect 11/15/93, 1/94.

DD. Virginia State Corporation Commission

- Petitions for Arbitration of AT&T-VA and MCI Communications Corporation for an Interconnection Agreement with Bell Atlantic - Virginia, 9/20/96.
- Petition for Arbitration of AT&T-VA for an Interconnection Agreement with GTE-VA, 8/96, 10/29/96.

EE. Washington Utilities and Transportation Commission

- Docket No. UT-960639 *et al.*, Phase II, In the Matter of the Pricing Proceeding for Interconnection, Unbundled Elements, Transport and Termination, and Resale, 8/20/98, 9/11/98.
- Docket No. UT-950200, Washington Utilities and Transportation Commission vs. U S WEST Communications, Inc., 8/28/95, 12/15/95.
- Docket No. UT-941464 *et al.*, Washington Utilities and Transportation Commission vs. U S WEST Communications, Inc., 4/17/95, 5/31/95.
- Docket No. UT-911488 *et al.*, Washington Utilities and Transportation Commission vs. U S WEST Communications, Inc.

FF. Wisconsin Public Service Commission

- In the Matter of the Petition of MCImetro Access Transmission Services, Inc. for Arbitration of Interconnection Rates, Terms, and Conditions Pursuant to 47 U.S.C. § 252(b) of the Telecommunications Act of 1996 (Ameritech – Wisconsin), 12/96.

EDUCATION

A.B., Oberlin College, Oberlin, Ohio. Major: Economics. National Merit Scholar, recipient of Hanson Prize in Economics, elected to Phi Beta Kappa.

M.A., M.Phil., Yale University, New Haven, Connecticut. Economics. Admitted to Ph.D. candidacy and completed all Ph.D. requirements except dissertation. Fields of specialization included industrial organization and energy and environmental economics. Honorable mention, National Science Foundation Fellowship; recipient of University Fellowship and Sloan Foundation dissertation research fellowship.